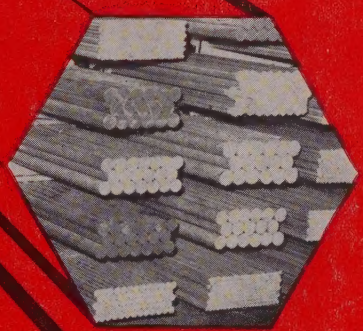
POSTMASTER: Modern Metals, 435 N. Michigan Avenue, Chicago 11, Illinois. Return Postage Guaranteed—Form 3597 Requested. • MARCH, 1960

MODERN METALS

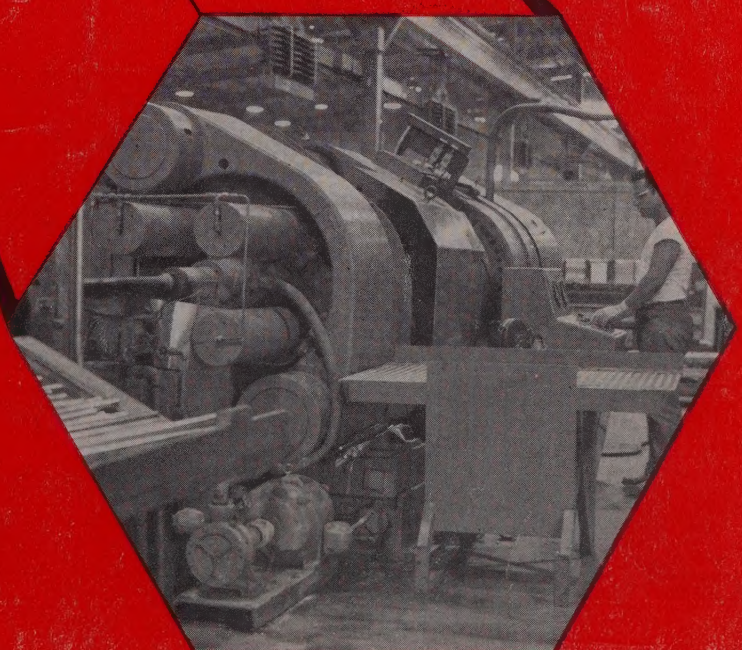


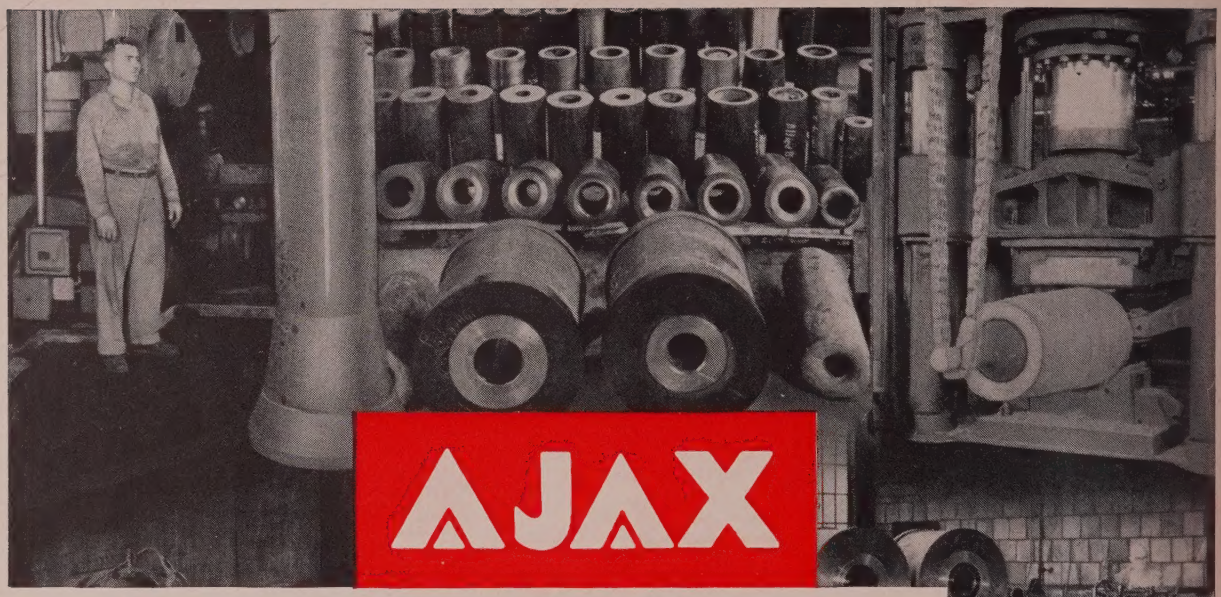
NEW WAY
TO MAKE ALUMINUM
SCREW MACHINE STOCK

Unique continuous casting and cold reduction methods widen aluminum's edge over other metals.

(see page 40)

Please Return to
Missile Systems Library
Raytheon Mfg. Co.





AJAX

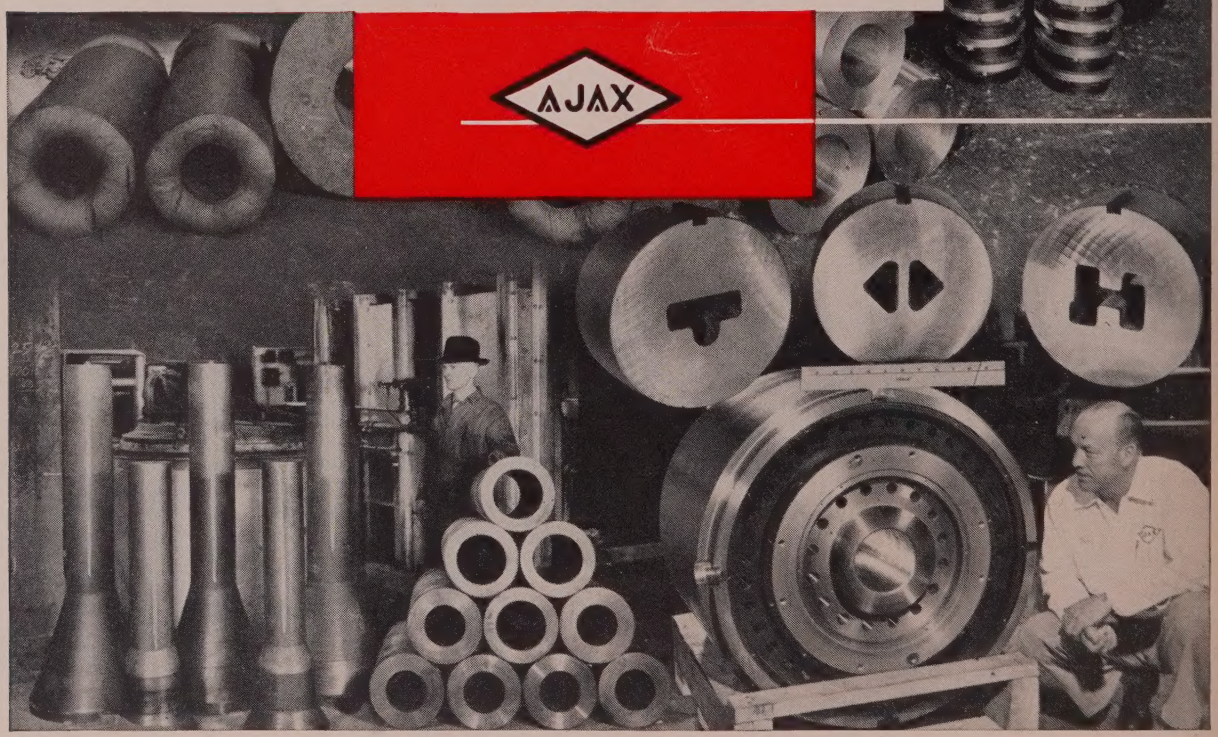
...America's
One Best Source
of Extrusion Tools

AJAX *Steel and Forge Co.*

205 ADAIR ST. DETROIT 7, MICHIGAN

LOrain 7-0755

AJAX



a pebble at 30
can be a landmine at 300

he harder you drive for
super speed production
he more you need safe-
guards offered you in...

Please return to
Missile Systems Library
Raytheon Mfg. Co.

SCOVILL ®

brass

copper

aluminum

MILL PRODUCTS

MADE IN USA

. . . and made better to bring out the ***BEST*** *in your products*

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone PLaza 4-1171

3SC60

Scovill's new Sendzimir Rolling Mill, producing closest tolerance, finest finish Brass and Aluminum Strip and Sheet.

SCOVILL®

features to help you take full advantage of today's **high speed** methods and machines

Metal soundness and uniformity — For more than 20 years, unique Scovill *continuous casting* machines have been supplying a major part of the cast brass bars and billets used to produce strip, sheet, rod, wire and tube . . . over two billion pounds of metal that is inherently sounder and more uniform in every respect. This means fast running capability, minimum down-time and rejects, better quality products.

Close-tolerance specifications — Modern high-speed fabricating equipment is increasingly intolerant of what once were considered minor variations in grain size, temper, dimensions, surface finish. Scovill advanced engineering and quality-control procedures, working with new close-tolerance production equipment, meet or exceed the demands of highest-speed fabrication.

Selection of the right alloys — Scovill Metals Research maintains a continuing program of research into the practical needs of mill products fabricators. Scovill's broad range of alloys permits recommendation of exactly the right properties and qualities for a given job.

The industry's most advanced packaging — Packaging of Scovill Brass, Copper and Aluminum Mill Products can make a specific contribution to speed and efficiency in your operations . . . save you handling time and space in storage . . . cut production down-time and start-up. Scovill innovations include extra-long-run coils; Fast-Feed wire packages; easy-to-handle bundling or boxing of rod and tube.

Any fabricator who has made Scovill a part of his competitive team knows that these are only a few examples of the down-to-earth help and service he can depend upon. Call in Scovill NOW . . . especially if you want to get ideas and help in selection of the BEST metal for an important new product.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

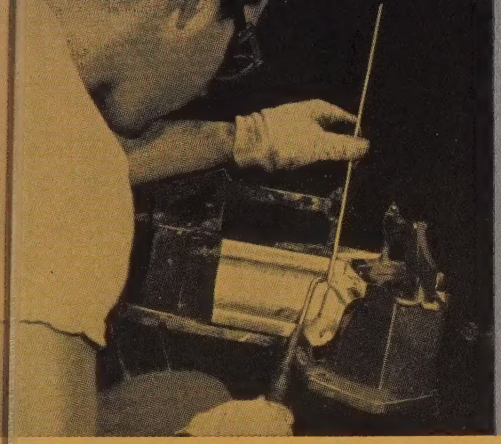
SCOVILL MANUFACTURING COMPANY
Mill Products Division, 99 Mill St., Waterbury 20, Conn., Phone Plaza 4-1171

MILL PRODUCTS

MADE IN USA

. . . and made better to bring out the **BEST** *in your products*

4SC60



How to join aluminum economically—by brazing

Brazing is one of the most efficient ways to join aluminum parts of various alloys on a mass production basis. The three most commonly used methods are torch, furnace and dip brazing. All have specific merits, all can lead to considerable savings. Whatever technique is used, brazing offers unique design and fabrication freedom.

In brazing, aluminum parts are joined with an alloy whose melting point is below that of the base alloy. The brazing alloy serves as the filler metal in forming the joint. The fact that the base metal never becomes hot enough to melt is the chief difference between brazing and welding.

Brazing differs from soldering in that the filler metal for brazing is an aluminum-silicon alloy whereas a dissimilar metal is generally used to solder aluminum. In addition, a brazed joint is generally stronger than a soldered joint.

Since the filler metal is an aluminum alloy, it actually diffuses into the parent metal and produces a continuous alloy system. The resultant metallurgical structure is similar to that obtained by welding. Its strength is of the same order, and corrosion resistance is high.

ADVANTAGES OF BRAZING ALUMINUM

1. If considered early in the planning of a product, brazing can simplify design, reduce weight, and cut manufacturing costs.
2. Brazing offers high production rates since many joints can be brazed simultaneously.
3. Brazing permits joining complicated assemblies not practical with other methods.
4. Brazed joints can be produced without highly skilled personnel.
5. Finishing costs are low with brazed joints because the resultant fillets are small and smooth.
6. Brazing produces an all-aluminum structure which retains aluminum's high strength and resistance to corrosion, and makes electrochemical finishing possible.
7. Good stress distribution and fatigue resistance characterize brazed assemblies.
8. Brazing lowers production costs by saving time, material, and weight, by cutting rejects and eliminating mechanical finishing of the joint assembly.

BRAZEABLE ALUMINUM ALLOYS

The wrought aluminum alloys of the non-heat-treatable type most successfully joined by brazing are 3003 and 1100. Heat-treatable alloys are brazeable if their melting points are above that of the filler alloys used. The most commonly brazed heat-treatable alloys include 6053, 6061, 6062, 6063, and 6951.

Some aluminum alloys are not recommended for brazing because presence of zinc and copper causes alloying constituents to melt at the high brazing temperature, affecting the properties of the alloys.

BRAZING MATERIALS FOR ALUMINUM

There are five types of filler metal for brazing. The chart below lists the alloys used and their approximate melting and brazing ranges.

Alloy	Nominal Silicon Content	Approx. Melting Temperature °F	Approx. Brazing Temperature °F
4043	5%	1070-1165°F	1150-1185°F
713	7%	1070-1135°F	1120-1140°F
716	10% + 4% Cu	970-1085°F	1070-1090°F
718	12%	1070-1080°F	1070-1090°F
719	10% + 4% Cu	960-1040°F	1030-1060°F

Since different aluminum alloys melt at different temperatures, the brazing alloy for any particular job is chosen to provide sufficient difference in melting temperature between filler metal and base metal to facilitate the brazing operation.

The closer these two melting points, the more difficult it is to melt the filler metal without melting the parts to be joined. The brazing temperature should be 75°—100°F below the melting point of the base metal, but, if sufficient care is exercised, it can be as close as 10°—20°F.

Filler alloy is available in several forms such as wire, wire rings, shims, or special sheets on which a uniform coating of filler metal is bonded to the core sheet.

Flux: Since all aluminum surfaces are covered with a natural oxide coating that varies in thickness depending on the alloy and its previous exposure conditions, a flux must be used to remove the oxide before brazing. The flux also promotes the capillary action which draws the molten filler metal into the joint. A thorough coating of flux on all surfaces to be brazed is therefore essential to obtain proper flow of filler metal, and to assure a completely filled joint. Correct choice of flux and mix is vital for good brazing.

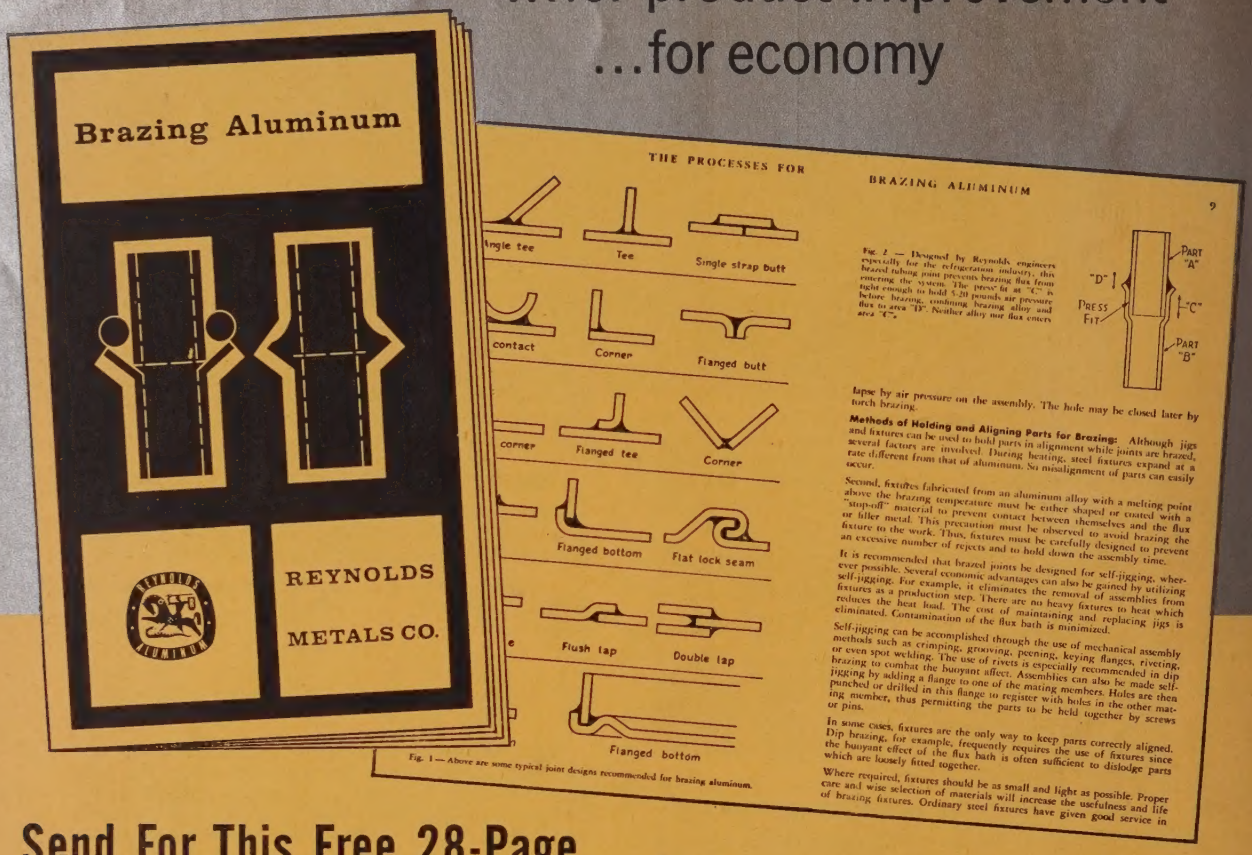
The above information is from the Reynolds Metals Company technical handbook, "Brazing Aluminum". For more details, or for a copy of this valuable booklet, see the next page.

And, to be sure you get the right aluminum —use Reynolds Aluminum

FREE booklet, "Brazing Aluminum"—see next page →

BRAZING ALUMINUM

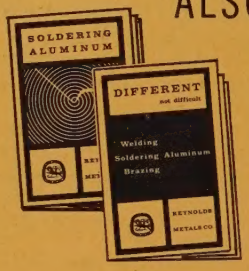
...for product improvement
...for economy


Brazing Aluminum
REYNOLDS METALS CO.
THE PROCESSES FOR BRAZING ALUMINUM
Single tee
Tee
Single strap butt
contact
Corner
Flanged butt
corner
Flanged tee
Corner
Flanged bottom
Flat lock seam
Flush lap
Double lap
Flanged bottom
Fig. 1 — Above are some typical joint designs recommended for brazing aluminum.
Fig. 2 — Designed by Reynolds engineers especially for the refrigeration industry, this brazed tubing joint prevents brazing flux from entering the system. The press fit at "C" is tight enough to hold 5-20 pounds air pressure before brazing, confining brazing alloy and flux to area "D". Neither alloy nor flux enters area "C".
"D"
Press Fit
"C"
Part "A"
Part "B"
lapse by air pressure on the assembly. The hole may be closed later by torch brazing.
Methods of Holding and Aligning Parts for Brazing: Although jigs and fixtures can be used to hold parts in alignment while joints are brazed, several factors are involved. During heating, steel fixtures expand at a rate different from that of aluminum. So misalignment of parts can easily occur.
Second, fixtures fabricated from an aluminum alloy with a melting point above the brazing temperature must be either shaped or coated with a "stop-off" material to prevent contact between themselves and the flux or filler metal. This precaution must be observed to avoid brazing the fixture to the work. Thus, fixtures must be carefully designed to prevent an excessive number of rejects and to hold down the assembly time.
It is recommended that brazed joints be designed for self-jigging, wherever possible. Several economic advantages can also be gained by utilizing self-jigging. For example, it eliminates the removal of assemblies from fixtures as a production step. There are no heavy fixtures to heat which reduces the heat load. The cost of maintaining and replacing jigs is eliminated. Contamination of the flux bath is minimized.
Self-jigging can be accomplished through the use of mechanical assembly methods such as crimping, grooving, peening, keying flanges, riveting, or even spot welding. The use of rivets is especially recommended in dip brazing to combat the buoyant affect. Assemblies can also be made self-jigging by adding a flange to one of the mating members. Holes are then punched or drilled in this flange to register with holes in the other mating member, thus permitting the parts to be held together by screws or pins.
In some cases, fixtures are the only way to keep parts correctly aligned. Dip brazing, for example, frequently requires the use of fixtures since the buoyant effect of the flux bath is often sufficient to dislodge parts which are loosely fitted together.
Where required, fixtures should be as small and light as possible. Proper care and wise selection of materials will increase the usefulness and life of brazing fixtures. Ordinary steel fixtures have given good service in

Send For This Free 28-Page New Reynolds Handbook

Authoritative, detailed, and clearly written, this new booklet describes all of the important aluminum brazing methods, and tells how and when to use them. A valuable aid to every designer, engineer and production man concerned with the manufacturing of aluminum. For specific information on brazing, or any phase of design or manufacturing with aluminum, call on Reynolds design and engineering service.

ALSO AVAILABLE



"Soldering Aluminum" and "Different, Not Difficult — Welding, Soldering, Brazing Aluminum". Two companion handbooks to "Brazing Aluminum" on aluminum joining methods. A *must* for every technical library.

Reynolds Metals Company
Box 2346-GM, Richmond 18, Virginia

Please send me the new Reynolds handbook, "Brazing Aluminum."

Also, please send_____

Name_____

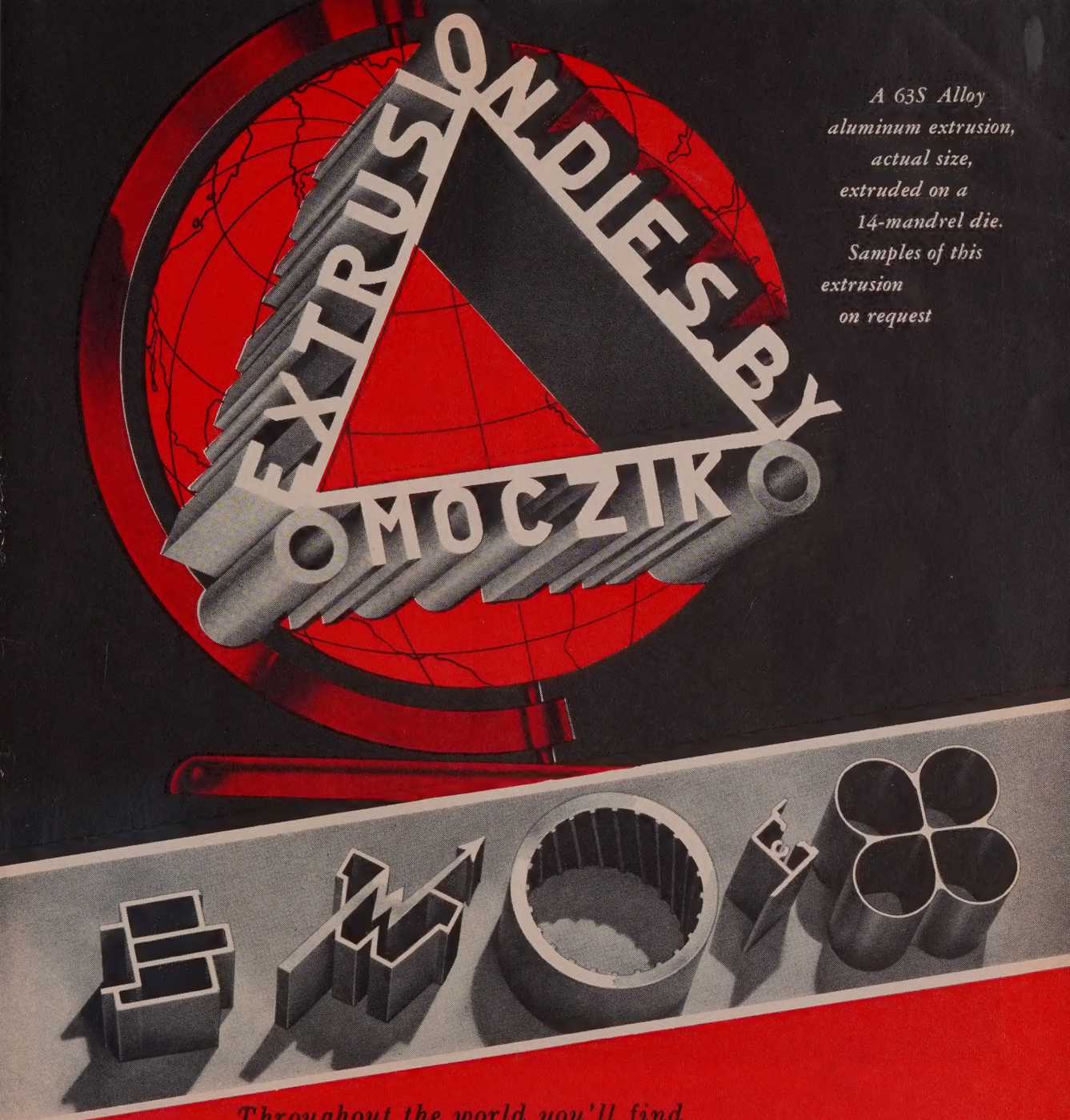
Firm_____

Street_____

City_____ Zone_____ State_____

REYNOLDS ALUMINUM

Watch Reynolds TV shows: "ADVENTURES IN PARADISE", "BOURBON STREET BEAT" and "ALL STAR GOLF"—ABC-TV



A 63S Alloy aluminum extrusion, actual size, extruded on a 14-mandrel die. Samples of this extrusion on request

Throughout the world you'll find

EXTRUSION DIES *by* MOCZIK

Pictured above are some intricate shapes, thought to have been impossible to extrude . . . Yet MOCZIK manufactured the necessary dies and these shapes are now production items. For your more difficult shapes, as well as the less complex solids and hollows, *come to MOCZIK.*

4 PLANTS IN THE U. S. A. AND CANADA

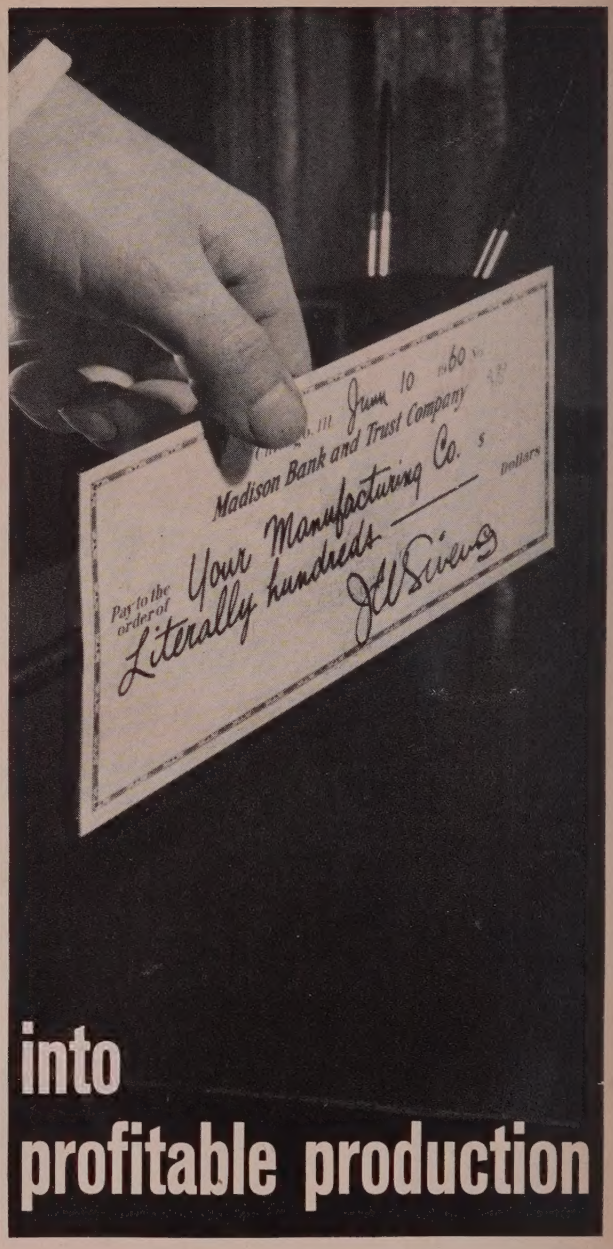
MOCZIK TOOL AND DIE WORKS

9511 Grinnell Avenue • Detroit 13, Michigan • Phone: WAlnut 3-7450
Bad Axe, Michigan
12425 N.E. 13th Avenue • North Miami, Florida • Phone: PLaza 7-8531

MOCZIK TOOL AND DIE OF CANADA, LTD. R. R. 1 • Chatham, Ontario • Phone: ELgin 2-3940

COMPLETE ENGINEERING SERVICE AND DESIGN FACILITIES • ESTABLISHED 1939 • ACTUAL EXPERIENCE SINCE 1925

turn your waste aluminum



into profitable production

You can eliminate scrap aluminum and start getting a *return* on the money, time and labor it took to produce this waste. The Ryerson Aluminum Sheet Plan makes exact lengths and widths available to most users —generally on a *net-weight basis*.

Order the exact sizes you need for production runs —Ryerson cuts them to size and schedules delivery to match your production-line pace. You save the cost of needless scrap, save the cost of cutting, save the cost of inventory, and release valuable storage space for other use.

At Ryerson you'll also find the widest selection of aluminum alloys, tempers and gauges—plus expert technical help on selection and fabrication problems. This is just one more example of Ryerson "Metalogics" and how it helps you get the most value for your purchasing dollar.

So be "Metalogical"—call Ryerson.

METALOGICS
RYERSON PLUS VALUE

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

RYERSON STEEL®

Joseph T. Ryerson & Son, Inc., Member of the INLAND® Steel Family

PLANT SERVICE CENTERS: BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT • HOUSTON • INDIANAPOLIS
LOS ANGELES • MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO • SEATTLE • SPOKANE • WALLINGFORD

POSTMASTER: Modern Metals, 435 North Michigan Avenue, Chicago 11, Illinois. Return Postage Guaranteed—Form 3579 Requested.

MODERN METALS

Read in companies that produce, fabricate and cast aluminum, magnesium and titanium, and firms that use these metals in manufacturing end products.

ON THE COVER: Despite its demonstrable advantages in screw machine work, aluminum isn't doing as well as it should in this industry. What's needed most is more vigorous promotion. But it would also help a lot to upgrade the quality of aluminum bar stock without raising the price. That's what Hunter Engineering had in mind when it developed its cold processed bar stock, the production of which is described in the article beginning on page 40.

EDITOR
W. B. GRIFFIN

SENIOR EDITOR
F. L. CHURCH

ASSOCIATE EDITORS
H. K. DARBY
K. B. RHODIE

ASSISTANTS
J. M. STARR
L. ZIONS

CIRCULATION
G. R. STARCK
E. MORRIS
M. A. PAGE

ADVERTISING
CHICAGO JOHN REILLY, PAUL MESSER
NEW YORK DICK PULLIAM

MODERN METALS EXECUTIVE OFFICES
435 N. MICHIGAN AVE., CHICAGO 11, ILL.
DElaware 7-0638

Modern Metals is published monthly by Modern Metals Publishing Co., not incorporated, at Barrington, Ill. Printed in U.S.A. Subscription in the United States: To fabricators and users of light metals—$3.00 one year; $5.00 two years; $6.00 three years. To all others in U.S.—$10.00 per year. Foreign $9.00 one year; $15.00 two years; $21.00 three years. Back issues: $1.00 each.

Modern Metals has by far the world's largest circulation among light metals fabricators, foundries and product manufacturers who use aluminum, magnesium, and titanium. Circulation: Now over 15,000 copies per month. Acceptance under controlled circulation at Barrington, Ill.

Copyright Modern Metals Publishing Co. 1960

PUBLISHER W. B. GRIFFIN

Modern Metals

VOLUME XVI **MARCH, 1960** **NUMBER 2**

LETTERS 10
HERE & THERE 14
USEFUL DATA 22
NEW ENTERPRISE 30
NEWS, PRODUCTS & PEOPLE 90
LOOKING AHEAD 111

'Price Squeeze' Charge Renewed **38**

Aluminum Extruders Council urges three primary producers to lower pig price in U. S. to the rate charged in foreign markets. But producers defend the dual structure saying present domestic price barely covers promotion, research and development costs.

A Boon to Screw Machine Shops ..... F. L. Church **40**

A new production process is used to yield a superior species of aluminum rod and bar. It is made by Hunter Engineering and sold by Olin Aluminum.

Riveted Aluminum Bridges **48**

The country's first riveted aluminum bridges will be opened to drivers on the Long Island Expressway this spring.

Welding the Lincoln Grille ..... W. O. Shropshire **52**

Kawneer uses aluminum's durability, extrusion's design latitude and welding's speed to make grilles for Lincoln automobiles.

Aluminum Trade Freedom Urged ..... N. V. Davis **56**

Author says Europe's rising need for aluminum can be met by outside suppliers if tariff barriers are lowered.

Builders and HIPsters Talk Big ..... K. B. Rhodie **60**

Recent trade show points up perils of shady practices by home improvers; Builders' Show clouded by predictions of dropping home starts; aluminum gains in both industries seem certain.

Precision Welding of Aluminum **70**

Here are details of exacting welding job needed to fabricate housings of azimuth alignment theodolites.

Welded Aluminum Tube **72**

This is a production reality for a group of companies in England that produces TV antennas, summer furniture and tube for commercial distribution in Great Britain and other countries.

Ramjets Rely on Mag-Thorium Castings ..... C. P. King **76**

Casting cuts costs while new alloys hold strength at high temperatures, but other problems arise. Here's how one user solved them.

Etched Capacitor Foil Output Boosted by Republic Foil **84**

New plant is devoted exclusively to etching foil for electronic applications; culminates 11 years of costly R and D.

COLOR
Anodizing

Aluminum parts, shapes, stampings, castings—all sizes up to 16-ft. lengths—now color anodized on fully automatic equipment. Volume pick-up and delivery throughout Central and Eastern United States.

COLORS, INC.
5774 MASSACHUSETTS AVE., INDIANAPOLIS, IND.

Phone: LI 7-5253

Letters

Is Modern Metals "Beat" On Arrival?

Sirs:

I just received your February issue which comes in the mail with just a sticker on the cover. I have noticed for some time that this magazine for some reason or other takes a beating far worse than most publications.

I realize that an envelope or even a sheath costs money. It would seem to me a worthwhile investment, however, in view of the fact that the present appearance of your magazine as it reaches the readers' hands definitely creates an unfavorable impression.

"E"—Ohio

MM—Over the years we've had many fights with the post office about nondelivery of the book, failure to inform us of an address change, and failure to return Modern Metals if undeliverable. (We're the only magazine we know of that guarantees return postage which costs us about 25c a copy.) Since the post office continues to get more expensive to operate and more inefficient—despite greatly increased volume and revenue—we are prepared for the worst.

A few years ago we started mailing each issue with just the label on the cover to cut costs. Recently we've heard from some readers that the issues are arriving torn or battered. Sometimes only the cover arrives. But not enough evidence has come in to indicate a trend.

If your copies are arriving in a damaged condition, please, drop us a card. If we hear from enough, we go back to a wrapper—but quick.

The Coors Aluminum Beer Can

Sirs:

Please send to us either two reprints of the article in your January 1960 issue about the aluminum can process developed by Adolph Coors Co., or two copies of the issue itself.

Please let us have your bill for the cost, plus postage, and we will settle with you promptly.

"C"—Fiji Islands

Sirs:

In looking through the January issue of Modern Metals I came across your article entitled "Man of the Year: William K. Coors." While reading through this article, I noted that Coors uses a German made offset printer to label extruded cans.

We do a great deal of labeling here at the General Electric Capacitor Department, and it has always been a headache with us. We have pretty much tried every piece of domestic equipment available, but with only moderate success.

I wonder if it would be possible to acquire the name of the German manufacturer of Coors' printer and if they have a representative in this country . . . .

"J"—South Carolina

MM—The company is Alfons Mall Company, 37 Woeschbackstr., Berghausen-Baden, West Germany.

They have a U. S. representative as follows: Hancor, Inc., Industrial Machinery,

13
YEARS OF ANODIZING & ELECTROPOLISHING RACK MAKING MARK US AS SPECIALISTS IN THE INDUSTRY!

Leading metal fabricators attest to our pioneering leadership and the superior quality of our ALL TITANIUM racks!

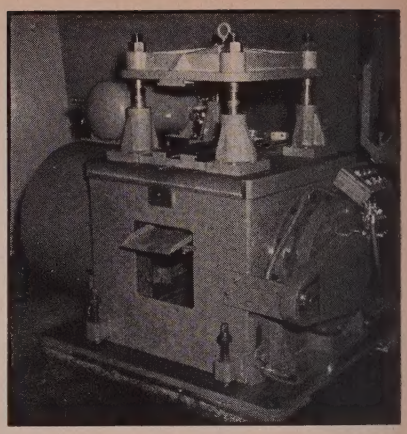
ANODIZING RACK SPECIALISTS SINCE 1946

Inquire about our standard or custom engineered racks!

Write for FREE Catalog MM-1

SERVI-SURE MFG. CO.

131 N. Green Street Chicago 7, Illinois
CHesapeake 3-7383
Formerly — Service Screw Products Company



MRF Cut Off Press...

This cut off and notching press is available in 5 models: 8 to 50 ton . . . die widths from 9" to 20" . . . motors from 1 to 15 HP. Full wave rectification for closer moulding length accuracy. "MICHIGAN" is also a specialist in rolls and roll forming equipment. Send for new brochure.

Michigan Roll Form, Inc., 8950 Hubbell, Detroit 28, Mich., Phone VE 6-1844

MICHIGAN ROLL FORM

For Sale

Aluminum Extrusion Press

Including Die Oven, Heat Treat Furnace, Billet Heating Furnace, Stretcher, Run-out Table, and Saw.

$85,000.00

BOX 1111

MODERN METALS
435 N. Michigan Ave.
Chicago 11, Ill.

Aluminium Limited announces . . .

A new spring promotion to increase your Aluminum product sales!

1. National advertising—sights *you* in on 60,000,000 readers . . . 2/3 of your homeowner prospects—will increase demand and interest in aluminum products made by you and your customers.

2. An exciting new, 36-page booklet written and illustrated as a practical, hard-working sales tool for aluminum product dealers.

Read how you and your customers can make an immediate tie-in to both parts of the program.

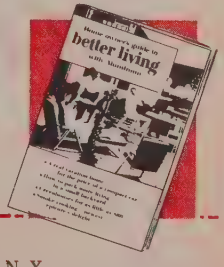
Here's sales help where it counts . . . right at the retail level—a campaign created to seek out homeowners interested in aluminum products made by you and your customers.

In big, full-color spread advertisements in THE SATURDAY EVENING POST . . . BETTER HOMES & GARDENS and THE AMERICAN HOME the campaign features your fast-moving Spring items . . . aluminum building products.

Again—as in Aluminium's Fall promotion which drew more than one hundred thousand inquiries from every part of the nation—there is an attractive booklet offer. This time a new 36-page booklet, "Homeowners Guide to Better Living . . . with Aluminum."

The booklet has been prepared especially for your promotional use at the retail level. Written in an interesting editorial style, beautifully illustrated—it's a sales tool your dealers or your customer's dealers will be proud to use. It can be used for more effective, more personalized selling. As an attention getter! Door opener! Mailing piece! A professionally conceived promotion piece for give-away at the point of sale!

Send the coupon today . . . ask how you can get copies of the booklet for your dealers or for customers. We'll be pleased to send you all the details.



SEND COUPON TODAY . . . FOR FACTS ON NEW BOOKLET OFFER AND NEW SPRING PROMOTION KIT.

Aluminium Limited

ALCAN

NEW YORK · CLEVELAND · CHICAGO
LOS ANGELES · DETROIT · ATLANTA · ST. LOUIS

Aluminium Limited Sales, Inc.
630 Fifth Avenue, New York 20, N. Y.

Gentlemen: Kindly send me samples of 36-page booklet "Homeowners Guide to Better Living . . . with Aluminum" along with a copy of your new Spring Promotion Kit.

Name_____

Firm_____

Address_____

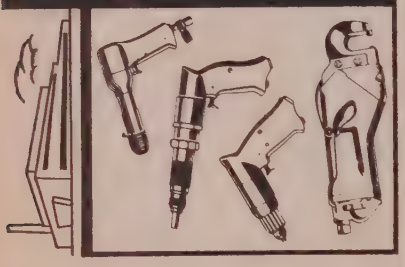
City_____ State_____

U.S. AIR TOOL CO.
PNEUMATIC TOOL DEALER FOR INDUSTRY

RIVETING AND ASSEMBLY SPECIALISTS — LARGEST SELECTION OF PNEUMATIC TOOLS IN THE U. S.

- PNEUMATIC DRILLS
- RIVETERS
- "JOB FITTED" SCREW DRIVERS
- STOP COUNTERSINKS
- BLIND RIVETERS
- IMPACT WRENCHES
- SANDERS - POLISHERS
- AIR HAMMERS

SAVE UP TO 40%
REPAIRS • RENTALS
BOX 228, ELMONT, L. I., N. Y.
TEL. CUrtiss 5-6626



SALES MANAGER
POSITION WANTED

Aluminum extrusion representative in middle Atlantic states having eight years experience with large prominent Eastern extruder desires sales manager position. Reply, giving details and salary to . . .

BOX 333

Modern Metals, 435 N. Michigan Ave., Chicago 11, Ill.

puzzled ?
about cleaning or finishing aluminum

Better get a copy of the 36-page reprint

How to Clean and Finish Aluminum

use order form on page 77

468 4th Avenue, New York 16, New York.
Reprints of the 10-page article are available at $1.00 a copy.

Light Metals Buyers Directory

Sirs:
I understand that you periodically publish a directory of major suppliers of light metals equipment and services. Can you supply us a copy?

"J"—Massachusetts

MM—The last one was published in our February issue, and a reprint of it has been mailed. To others who didn't see it, a free copy is yours for the asking.

Fifteen Frantic Years!

Sirs:
I read with interest your "Fifteen Frantic Years" which appeared in the February, 1960 issue of MODERN METALS. I wish to compliment you on your excellent summary of this very active period in the history of light metals. I would very much appreciate receiving a reprint as mentioned at the conclusion of the article.
Congratulations on your healthy growth and contributions to this progressive field.

"E"—Pennsylvania

Sirs:
Thanks so much for your amusing "Fifteen Frantic Years." It is an excellent (plus entertaining) review of the aluminum industry.
We would like to take advantage of your generous offer of reprints of this article . . .
May your "ups" continue to outnumber your "downs."

"M"—Texas

Sirs:
Your article, "Fifteen Frantic Years," is excellent! I would like very much to send copies to our directors so will you please send me twelve reprints.

"G"—Indiana

Sirs:
I had the pleasure of meeting you some years ago. . . . I recall that at that time MODERN METALS was a young and struggling publication, and I have enjoyed watching it grow in stature.
Your review of the "Fifteen Frantic Years" was extremely interesting, and I would very much appreciate having a reprint. I disagree with only one thing—and that is that your outlook is "fuzzy." I am confident that MODERN METALS will continue to grow and prosper along with the industry that you have tied yourself to.
In reading the Letters to the Editor, I was interested in noting the inquiry from "C" of California in connection with aluminum Christmas trees. During 1959 we were one of the leading producers of aluminum Christmas trees, and we would be very happy to work with Mr. "C" in 1960. If you will put us in touch with him, we will try our best to spare him the pain and anguish of getting into the competition.

"W"—Wisconsin

MM—We printed 1000 reprints of our first fifteen years; had visions of a surplus; quickly ran out of copies; wish we had more; are sufficiently encouraged by the letters received to take a shot at another fifteen.
As for the Wisconsin outfit that wants to make Christmas trees for the California group, we're making "pen pals" out of them.

HIGH IN CONDUCTIVITY — LOW IN WEIGHT

2-INCH ALUMINUM SUN-FIN ® RADIATION
BOX 6044, SUNNY SLOPE, KANSAS CITY, MO.
WRITE FOR DESCRIPTIVE LITERATURE AND PRICES

WANTED...
ALUMINUM
SALESMEN

We are looking for aggressive salesmen experienced in selling aluminum sheet and coil.

Territories available in South and Mid-West.

If you want to join a young, fast-growing company offering exceptional opportunities, write us listing your past experience and giving complete qualifications.

QUAKER STATE
METALS CO.
LANCASTER, PA.

GEI EXTRUSIONS

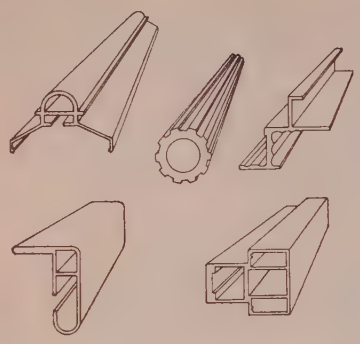
operate smoothly day-in, day-out BETWEEN TWO TEMPERATURE EXTREMES

for UNIVERSAL CABINETS

• It's cold inside Universal Cabinet's Model GT-23. It has to be to keep ice cream and other frozen products at a constant degree of coldness. Separating this frigid atmosphere from the warm temperatures outside the cabinet is fog-free glass... framed in aluminum sections —extruded, fabricated and anodized by GEI. The GEI aluminum shapes used in the manufacture of Universal Cabinets must: (1) Perfectly fit the glass and the cabinet to keep cold air from escaping and warm air from entering; (2) Slide freely at all times—hundreds of times each day—without binding or sticking; and (3) Add beauty to the overall handsomeness of the cabinet.

This is another example of a leading manufacturer solving his requirements for durability, beauty and economy with GEI's uniform quality, complete conformance to critical specifications, and unfailing delivery. Discuss your extruded aluminum needs—one part or a million—with GEI.

GENERAL EXTRUSIONS, INC.
4040 LAKE PARK ROAD • YOUNGSTOWN, OHIO
Sales Offices at St. Louis, Pittsburgh, Chattanooga, and Cleveland
Consult Your Classified Phone Book Under Aluminum Products



EXTRUSION, FABRICATION AND ANODIZING KNOW-HOW AT NORTH AMERICAN MEAN

√ clean extrusions
√ distinctive finishes
√ design cost savings
√ prompt delivery
√ competitive prices

FACILITIES INCLUDE:
extrusion presses; fabricating equipment; polishing and buffing machines; anodizing tanks (up to 25 feet); plus skilled engineers with experience that can help you produce better, more economical aluminum products.

SEND FOR BROCHURE "F" describing these facilities

NORTH AMERICAN EXTRUSIONS CORP.

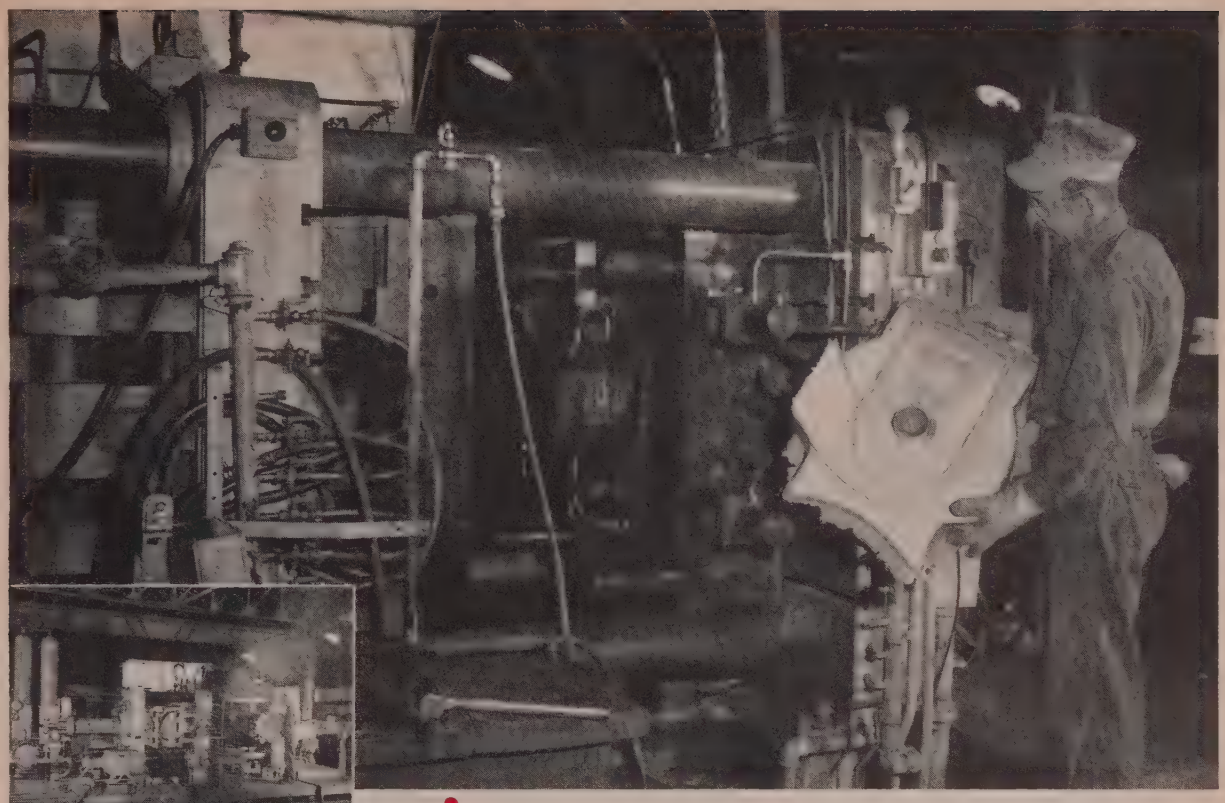
5569 N. Riverview Drive, Kalamazoo, Mich.
Phone FI 5-8618

Here and There

On the Warpath Again » » The Aluminum Extruders Council is once more after the scalps of three well-known primary aluminum producers (seems that the other primaries are immune). We tried to cram all the charges, counter-charges, etc. into one page of this issue (page 38), but ran out of space. Most of it may sound tediously familiar to readers who have stuck with us these past several years. Only new twist is the AEC's demand for pig priced at the same level the producers charge their foreign customers, which is roughly 3 cents under the U. S. price if you add the cost of freight and the like. The producers can't be accused of an overly strong defense. They intimate that export sales help hold domestic prices down by keeping the potlines running at efficient rates, but add that they have to sell at the competitive price in foreign markets. Anyway, they claim, the domestic price of pig barely covers the cost of research, promotion and all that. (This may strain the credulity of some veteran industry observers.) So the research-promotion tab would seem to be anywhere from 6 to 8 cents a pound. (We'll let the reader himself translate that in terms of dollars per ton.) It would also seem that the producers are losing money—or barely breaking even—on their sales abroad. (We are assuming that the AEC's figures on ingot production costs are correct, since the producers did not challenge them.)

Who Started It? » » What the producers neglected to say is that it's their privilege to sell in any market at any price as long as they can get it, and as long as they don't violate any laws. The extruders are justifiably concerned about the slim price spread between pig and soft alloy extrusions. The AEC implies that the producers dictate the price of extrusions, but most extruders will privately admit that the price cutting binge was started by a few small shops, spread to the more reputable small extruders, and finally engulfed the producers and big independents. Damn few extruders had the guts to resist. Result: A chaotic price structure under which a 5% gross profit is an exemplary performance.

Slick Strategy » » The Extruders Council injected some comic relief into this grim drama when it observed: "The move of the big aluminum producers to take over the extrusion industry . . . is well advanced." If this is the producers' intent, their strategy has been marvelously deceptive. Back in 1950 they commanded 65% of the extrusion market. Their "foe" (independent extruders) numbered 36. Within seven years their campaign to take over the industry had progressed to the point where they accounted for 39% of the more than 347,000 tons of extrusions shipped in 1957. The enemy ranks had thinned to 120 independent extruders. Flushed with success, the primary producers have consolidated their position (maybe 30% of total extrusion shipments) and decimated the foe (153 independents). At the rate they're going, they should have about 10% of the soft alloy extrusion business by 1965. Readers with good memories may recall that early in 1958 the Aluminum Extruders Council solemnly intoned this gloomy statement: ". . . the price squeeze on independent soft alloy extruders has been intensified by Alcoa, Kaiser and Reynolds to the point where the profit has been squeezed out of soft alloy custom extruding for many extruders. There is now threatened a reversal of the growth trend of the independent extrusion industry." There were about 120 independent extruders at



● Big, solid 17 lb. castings are housings for rotary power lawn mowers. Production averages 80 housings per hour. This is a 1000-ton Cast-Master Die Casting machine — one of two in this plant.

● All operating elements of this efficient 1000-ton Cast-Master are conveniently accessible for instant adjustment or inspection.

● Cast housings are removed from die, inspected and then dunked in the cooling tank at right. Parts are conveyor fed to trimming presses, then drilled and cleaned prior to assembly.

● Minor finishing is required after trimming. The racks in background represent about one-half hour's production for one machine.

"CAST-MASTER'S TOGGLE CLAMPING GIVES US UNIFORM DENSITY-LESS FLASH"

G. L. Graft, Divisional Supt. for The Newark Ohio Company Newark, Ohio stated, "We like Cast-Master's die locking toggle mechanism and the rugged qualities of these machines. They've been doing a fine job for us on all sizes of castings up to 17 lbs. each. They're fast; scrap loss and flash are negligible." This company manufactures Kenmore Electric Ranges and Craftsman Rotary Power Lawn Mowers, exclusively for Sears, Roebuck and Company.

If you're moving into the die casting field involving new, larger castings, investigate the Cast-Master line of high production die casting machines — 100-ton to 2000-ton capacities—cold chamber or hot chamber models. Write for Bulletin CM-100.

H26

H-P-M DIVISION - KOEHRING COMPANY

CAST-MASTER

23901 AURORA ROAD, BEDFORD, OHIO

carl mayer Designs and Builds Better ALUMINUM Extrusion **AGEING OVENS**

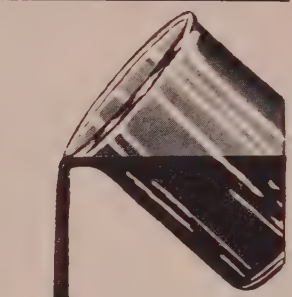
This truck type oven is now in service at Penn Extrusion Corporation, Erie, Pa. Close temperature control is maintained through the use of two gas fired, recirculating air heating systems. Other Carl Mayer design features assure trouble-free, economical operation. Write for Bulletin HT-53.

THE **carl mayer** CORP.

20800 CENTER RIDGE ROAD, CLEVELAND 16, OHIO

OTHER PRODUCTS: Core & Mold Ovens • Rod Bakers • Paint and Ceramic Drying Ovens • Special Processing Equipment & Accessories

For Better Finish, Longer Die Life, Ease of Application In Your Extrusion Process Use Graphite Dispersions



GRAPHITE PRODUCTS CORPORATION manufactures metal working dispersions for the newer metals and alloys. Each formulation has been developed for a specific application. Factory testing has shown that some of our compounds can be used successfully in many different operations. Bulletin 581 briefly describes some of these products and their uses.

GRAPHITE PRODUCTS CORPORATION welcomes the opportunity to develop formulations to meet your particular needs. A qualified staff consisting of application engineers as well as research specialists is as near as your telephone. For immediate service telephone TUxedo 9-4221 (Warren, Ohio).

JUST A FEW APPLICATIONS:

Extruding

High Temperature Lubrication

Parting

Die Lubrication

Drawing

Descriptive literature and working samples on request.

GRAPHITE PRODUCTS CORPORATION

BROOKFIELD, OHIO

that time. Today there are 153. If the AEC runs true to form, the independents face a glowing future.

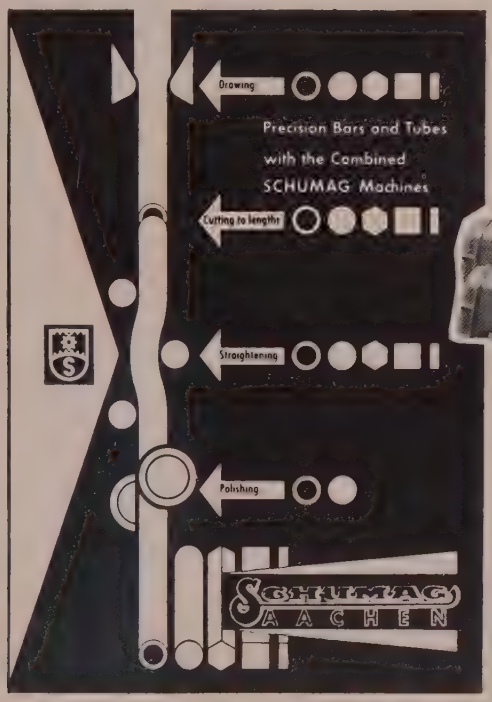
Mobile Homes Rolling » » You can't accuse the mobile homes industry of purposeless drifting, but its past 30 years of growth could look mighty slow compared with what's coming. Reason? Mobile homes makers are growing more responsible, thanks to tougher state codes and the activities of their own trade association. MHMA is fighting for (and winning) acceptance of its manufacturing standards; also has a trailer parks development program that should alleviate space shortages. At the same time, vigorous new blood is being injected into the industry by newcomers. Chance-Vought Aircraft, for example, saw its market drying up; looked around for diversification possibilities; gathered in three fair-sized mobile home makers; is now the biggest in the industry. Vought Industries, with its design, manufacturing and market savvy, can't help but hypo the mobile homes field, jar the competition. Last year the industry knocked out a record 150,000 mobile homes and travel trailers (smaller units for vacation travel). Unfortunately, the aluminum industry isn't fighting hard enough for a bigger share of the market. Steel is the dominant material in the big jobs; aluminum is favored for travel trailers, which are a poor second in volume. "Why should I use aluminum?" one manufacturer demanded. "Steel is cheaper and it shapes better. I used aluminum during the strike, and it sort of oil-cans when you bend it for that roof-to-sidewall radius. You get a beautiful line with steel." On the other hand, a publisher in the mobile homes industry thinks aluminum has a slight edge. "With building sheet, the difference between an aluminum and a steel mobile home averages about $45," he said.

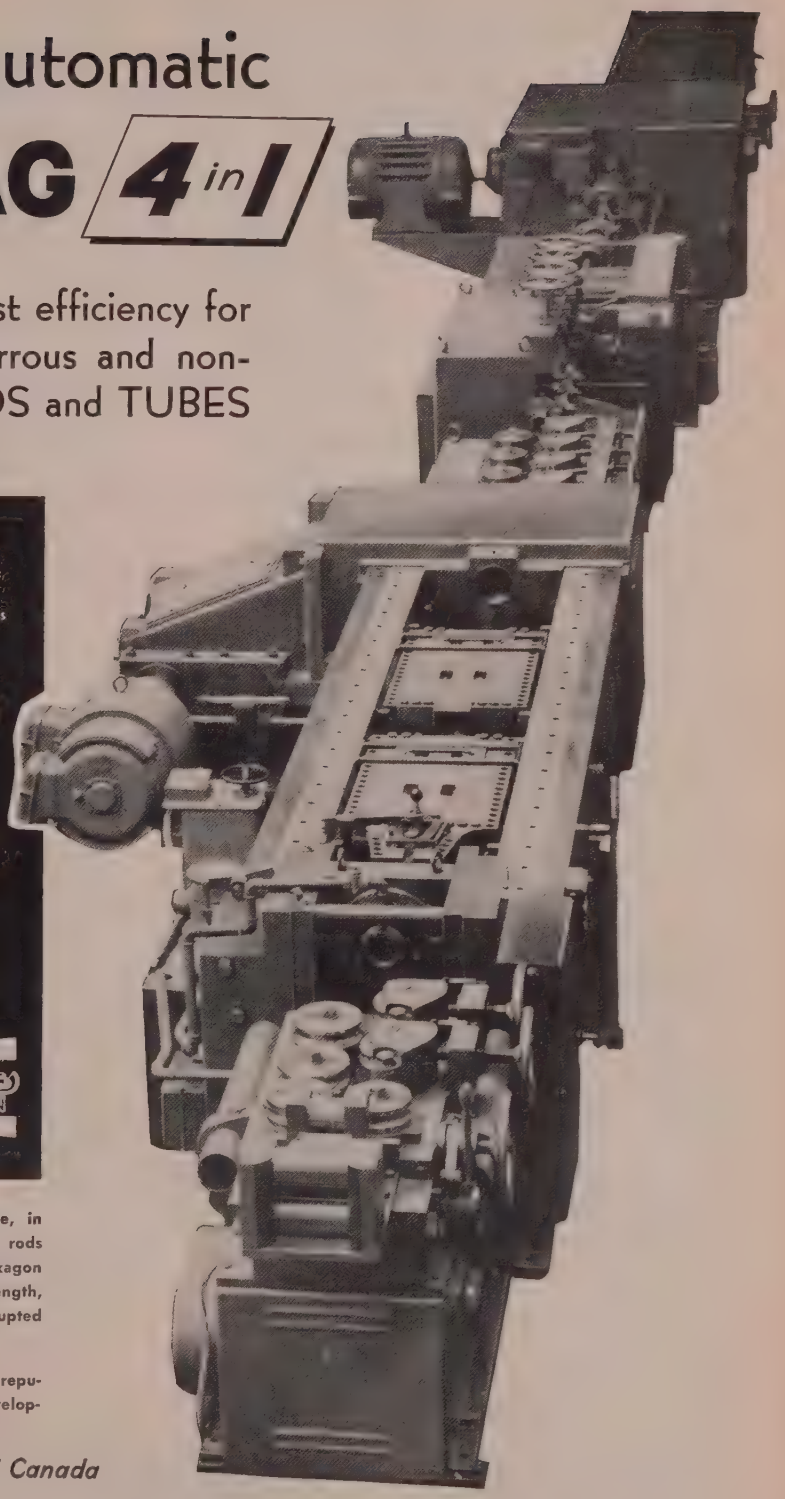
New Product for an Old Market » » Last month three aluminum producers set their sights on a market they have neglected for many years—the casting business—when they brought out a new raw aluminum product called "pig alloy ingot." Whatever its technical differences, this product's principal distinction is its price—25 cents or less per pound. Pricewise it is between basic pig at 26 cents a pound and so-called hot metal at around 23.5 cents. The move came as a surprise to many observers because the primary producers have traditionally shown faint interest in the casting market. The 3000 aluminum foundries and die casters have historically relied on secondary smelters for their metal. Last year they produced nearly 400,000 tons of castings for transportation equipment, consumer durables, electrical, machinery and other industries.

Smelters Will Suffer » » Clearly, the move is bad news to the 70-odd secondary smelters, who already face vexing problems. The price of scrap, their raw material, has been forced upward in recent years as a result of rising exports of scrap and the so-called "toll" practices of the primary producers. (Under this arrangement, the producer buys back scrap such as sheet clippings from a customer and converts it into useful form such as sheet or extrusion billet. The scrap is thus removed from the open market.) Smelters claim that producers offer premium prices for scrap in order to hold the customers' business. The high price of

The fully automatic
SCHUMAG 4 in 1

ASSURES... greatest efficiency for manufacturers of Ferrous and non-Ferrous BARS, RODS and TUBES





- SCHUMAG "4 in 1" machines produce, in one continuous operation, finished bars, rods and tubes from round, square or hexagon material. They will finish draw, cut-to length, straighten and polish in one uninterrupted sequence.
- SCHUMAG "4 in 1" enjoys world-wide reputation as the ultimate in technical development.

Exclusive Representatives for U.S.A. and Canada

AMERICAN LAUBSCHER
Corporation
250 W. 57th ST., NEW YORK 19, N. Y.

SCHUMAG AACHEN

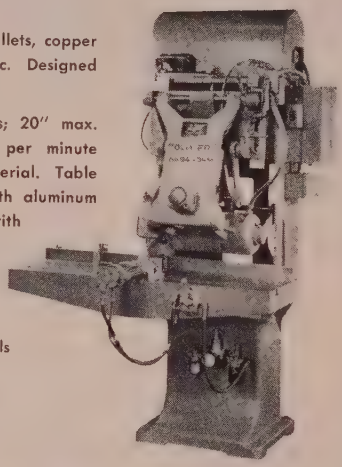
"OLIVER" No. 94-DHM HYDRAULIC CUT-OFF SAW

Cuts nonferrous metals without burr and at a high rate of production

For aluminum extrusions, billets, copper and brass bars, tubing, etc. Designed for precision performance.

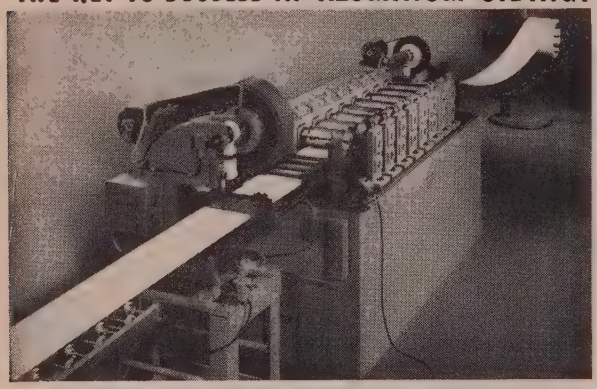
Saw: 14" std. for 3" cuts; 20" max. for 6" cuts. Stroke: 28 per minute maximum for 6" wide material. Table is cast iron 15" x 48" with aluminum throat plate and opening with chute for automatic removal of pieces up to 6" long.

Write for full technical details



OLIVER MACHINERY COMPANY
GRAND RAPIDS 2, MICHIGAN

THE KEY TO SUCCESS IN ALUMINUM SIDING!



EVERYTHING FROM ONE SOURCE TO BEAT COMPETITION

- The finest Aluminum Siding Production Line
- The best Aluminum Pre-coated Coil
- Complete line of Accessories and Components

Find out how practical and simple it is to become an Aluminum Siding Manufacturer with the Color Bound Method. This plan was developed by the foremost designers of Aluminum Roll Forming Equipment and encompasses all phases from simple manufacturing right through the ultimate sale to the consumer.

For full information about the Color Bound Plan, write to:

G. A. HERMAN

ARNOLD METALS & MACHINERY INC.
596 River Road, Clifton, N. J. PO-615

scrap trims the smelter's profit margin since his ingot must compete in price with primary ingot. Obviously, his margin will be trimmed even more by the producers' new pig alloy ingot.

Why It's Cheaper » » Producers say they can offer the new ingot at lower prices because of improved methods of alloying at the smelter and the lower cost of silicon. Like the "hot metal," it eliminates a pigging operation and a remelting step. (Unlike "hot metal," it doesn't eliminate freight.) But why have three "raw" products? For one thing, the producers would rather sell 26-cent pig than 25-cent "pig alloy ingot," or 23.5-cent "hot metal." But the big reason is to tap the huge market comprised of foundries and die casters, and thus keep the potlines running at more efficient levels. The difference between, say, 80% of capacity and 95% of capacity could be the difference between a profit and a loss. The first 300,000 tons of aluminum may cost 15 cents a pound, while the next 100,000 may cost 13 cents, and next 100,000 only 11 cents, etc. Running full blast, the producer could earn perhaps $6 million more a year. The arithmetic used here is purely hypothetical, of course, but it demonstrates why exports—and now the casting business—look more inviting to the primary producers. Another reason for this latest move may be Aluminium Limited's recent acquisition of Apex Smelting Co., the largest supplier of casting ingot in the U. S. This looks like a challenge that the U. S. producers can't afford to ignore. And don't be surprised if they, too, acquire a few secondary smelters. Such acquisitions would round out their sales organizations for a really serious bid for the casting ingot business.

Battle Over Boats » » A sharp conflict was evident at Chicago's International Amphitheatre last month as the Midwest edition of the National Boat Show unfolded for a record crowd of 326,550. The conflict, of course, is between aluminum and fiberglas. For several years aluminum appeared to be running away with the market. But then some manufacturers came out with slick, colorful glass boats which captivated a large segment of the boat-buying public. Though aluminum is still on top, glass is moving up fast. We got several surprising impressions as we ambled through the aisles of boats at the show. Example: Aluminum is almost unchallenged as the material for fishing boats. Another example: Outfits that also make glass boats are doing so to please the female half of the boat-buying family. Still another example: First-time boat buyers choose fiberglas because it looks "sporty," while the "old salt" prefers aluminum's proven durability, light weight, better performance and operating economy. A final example: Many glass boat producers are cutting their own throats by turning out inferior products which may look good trailing a car, but are somewhat ineffective after the hull takes a few kicks in the ribs and the boat slowly sinks to the bottom of the lake. We think aluminum's making a comeback in the boating field, but as the glass outfits learn their lessons, they will find a permanent niche in this growing industry. Next month we will offer a more detailed account of the "aluminum vs. fiberglas" struggle.

Press the button, that's all! The Ajax Magnethermic Billet Heater delivers a billet at exact temperature to the extrusion or forging press.

THE NEW NAME WITH THE FAMILIAR RING!

60 Cycle Induction Billet Heaters manufactured by AM . . . one of our many products for induction heating or melting of all types of metals.

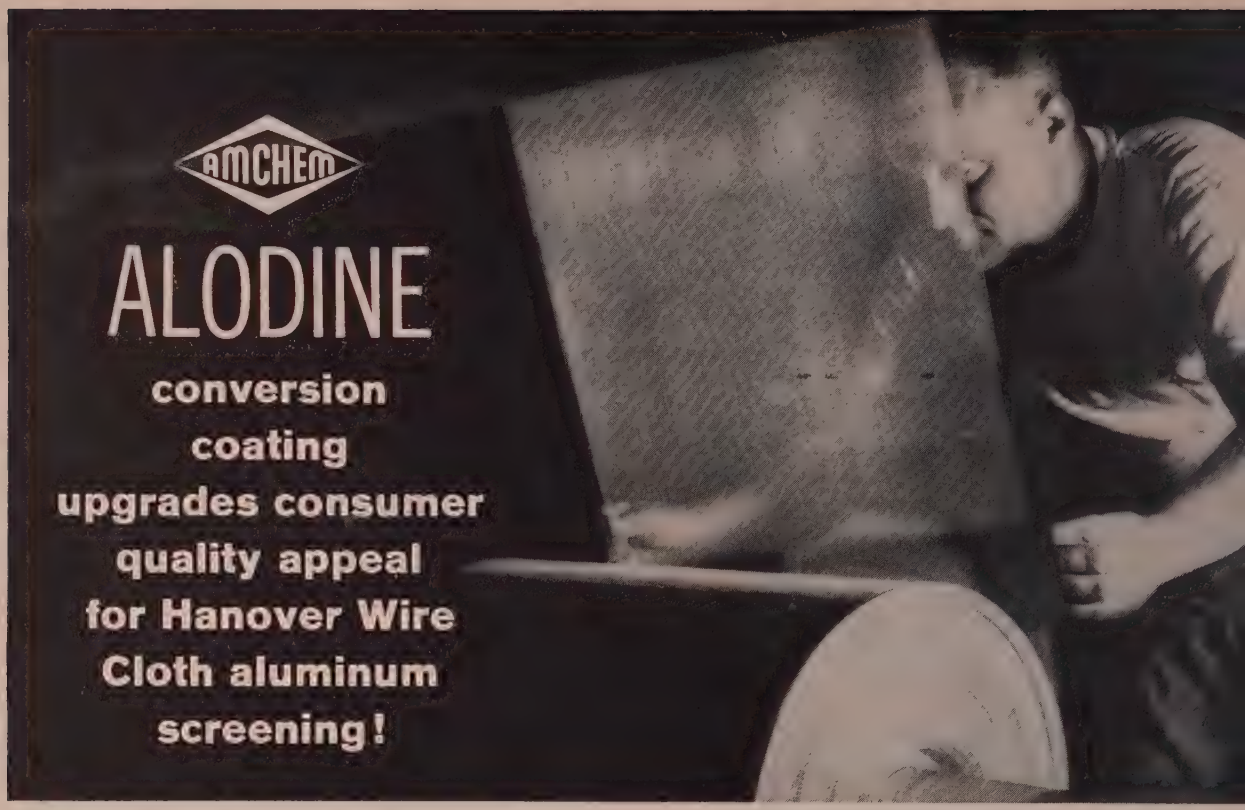
"induction heating is our only business"

Ajax Magnethermic CORPORATION

GENERAL OFFICES
P. O. BOX 839
Youngstown 1, Ohio

TRENTON DIVISION
930 Lower Ferry Road
Trenton 5, New Jersey

YOUNGSTOWN DIVISION
3990 Simon Road
Youngstown 1, Ohio



At big aluminum screening producer, Hanover Wire Cloth, Amchem Alodine has racked up a performance record far beyond the call of duty for chemical conversion coatings! The result—a line of non-glare, corrosion-resistant, color-fast aluminum screening that's making a startling impact in trade and consumer circles.

Use of Alodine at Hanover has the unqualified support and enthusiasm of management. E. B. Frock, Continental Copper & Steel Industries Vice President in charge of the Hanover Division terms Alodized aluminum "the screening of the future," that "eventually all aluminum screening will have to be treated before it is painted or finished, and Alodine is the better answer."

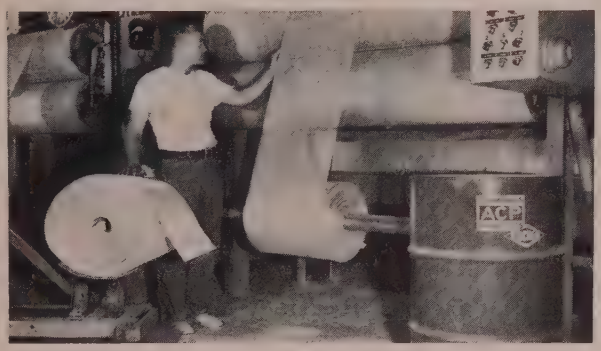
Hanover salesmen have proven Alodine's superiority as a sales tool in the field with a product benefits story that has been justified in actual use. Alodine-treated screening with its non-glare, corrosion-resistant, color-fast advantages has found immediate consumer acceptance for use in windows, doors, jalousies, carports, patios and swimming pools. Acceptance (and sales) of Alodized screening has been heavy nationwide, enabling Hanover to improve an already strong distribution position. Seashore use is particularly popular due to the ability of Alodine-treated screening to withstand the long-term corrosive effects of wind, salt and sun with amazing wearing qualities.

Hanover employs Alodine in an Amchem-developed and designed 5-stage system processing 903 foot rolls of Imperial screening in charcoal gray and soft green finishes at normal line speeds of 25 feet per minute in the 105-110 degree temperature range. Plans are being implemented to put Hanover on tandem roll operation. Automated chemical feed is currently being installed. Technical assistance by Amchem Representatives in setting up Alodizing operations on a production basis have resulted in bringing processing costs to a level reasonably competitive with standard or conventionally finished aluminum screening.

Strongest proof of Alodine-treated screening quality is found in the decision of one important Hanover customer to stock Alodized only and offer this one screening exclusively for the 1960 season. Hanover management, alert to consumer buying trends, looks ahead to the day when its entire output of screening will be *Alodized with Alodine* to provide in quantity this increasingly popular, uniform finished aluminum wire cloth.

The Hanover executive team examines roll of Alodine-treated aluminum screening. Left to right: R. C. Ampspacher, Production Manager; A. Y. Wolff, General Manager; Richard Bamford, Sales Manager; and E. B. Frock, Vice President.

At beginning of the Alodine processing line, worker adjusts screening as it enters. Tandem processing is planned since wide tanks will accommodate many widths in tandem. Automatic chemical feed is being incorporated into system.



At the end of the 5-stage Alodine processing line the chemically treated wire cloth is subjected to visual spot checking as it is rewound into 903-foot rolls.

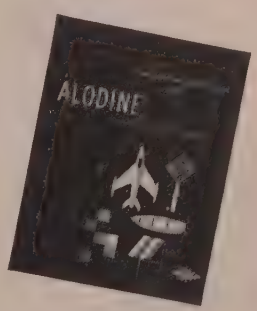
"Imperial" Alodized aluminum wire screening is packaged at Hanover Wire Cloth for shipment to customers nationwide. Each carton bears special Alodized label.

Unretouched photo shows remarkable see-thru-ability of Alodized screening used to enclose carport.

Photos and facts by Commercial Photography Division, United Press International.

The story of how Amchem Alodine helped Hanover Wire Cloth move out in front with new trade and consumer benefits appeared in the editorial pages of Modern Metals Magazine, November 1959 issue. If you'd like to learn more about how Amchem Alodine can help lend consumer appeal to your products, write for a reprint of the above article, or contact your local Amchem Representative!

Write for Bulletin 1424A describing uses of Alodine for aluminum fabrications of all types.



AMCHEM ALODINE

Amchem and Alodine are registered trademarks of **AMCHEM PRODUCTS, INC.** (Formerly American Chemical Paint Co.)
AMBLER, PA. • Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

ALUMINUM
and
LIGHT METAL BUYERS

you can
SAVE
as you
SPEND
when you
BUY from

PRODUCTION METALS, INC.

The Modern IN-STOCK Integrated Service Plant selling below regular Market Prices. FUTURE MILL DELIVERIES at very substantial savings.
(including Freight to your Plant)

NOW IN-STOCK { OVER 4,000,000 LBS. ALUMINUM in All Forms, Sizes, and Alloys.

- Geared to serve SMALL ORDERS as well as LARGE.
- SLITTING • SHEARING • CUTTING — to your specifications.
- Available for IMMEDIATE DELIVERY.

CALL COLLECT . . .
New York, Long Island, Westchester area: ..... WOrth 4-7900
New Jersey & other points... SWathmore 8-0200

GENERAL OFFICES:
PRODUCTION METALS, INC.
299 Pavonia Avenue • Jersey City 2, N. J.
WESTERN UNION: J D H Jersey City

"Metals for Industry"

SALES OFFICES & WAREHOUSES

THE PMI CORPORATION
9606 Franklin Avenue
Franklin Park, Illinois
GLadstone 1-1919

PRODUCTION METALS, INC.
4002 NW 2nd Avenue
Miami 37, Florida
PLaza 7-3446

PRODUCTION METALS, INC.
4665 Frankford Avenue
Philadelphia 24, Pa.
CUmberland 8-9212

Useful Data

Slitting lines for coils and sheets are covered and illustrated in revised 80-page book of Yoder Co. The first part covers basic information on design, selection and operation of slitters and slitting lines, including time studies and analysis of operating cycle, discussion of coil handling, and scrap disposal method. The second half handles specifications, capacity tables and other data on the company's standardized series of uncoilers, slitters, recoilers, coil cars and scrap choppers. For your copy write R. L. Burt, The Yoder Co., 5539 Walworth Ave., Cleveland 2.

"Automation for Pressroom Parts Handling" describes Press Hand, a mechanical extractor-loader made by Die and Automation Inc. The Press-Hand is shown in a variety of extracting applications and its specifications are charted. Diagrams show machine in different stages of operation. Robot control, which automatically runs the press, is also diagrammed and detailed. Booklet is available from Harry Blackburn, 5353 Dixie Highway, Hamilton, Ohio.

High speed cutting machines for ferrous and nonferrous metals are discussed in a brochure by Stone Machinery Co., Inc. The firm says the machines are engineered to cut all metals in less than 4 seconds per square inch, while producing an accurate, mill-like finish. The company manufactures manual, semiautomatic and automatic models, and does custom work. Also shown in the brochure are abrasive wheels and saw blades. Copy can be had from Arthur R. Stone, Stone Machinery Co., Inc., Manlius, N. Y.

Heat processing installations, built by The Lanly Co., are described in Bulletin 580. Diagrams, photographs and descriptive text are used to explain each set-up. Equipment is available for die heating, billet homogenizing, billet or slab pre-heating, extrusion ageing and annealing, coil and foil annealing, aircraft plate ageing, horizontal and vertical solution heat treating. Use company letterhead when writing James Lyle, The Lanly Co., 2800 Euclid Ave., Cleveland 15.

Mechanical joining of aluminum parts is covered in handbook by Reynolds Metals Co. Detailed are methods such as nails and pins, metal stitching, mechanically formed joints and architectural fasteners. Illustrations show machines at work, individual fastening items and products that use some sort of mechanical fasteners. For copy of this 32-page book write Reynolds Metals Co., Dept. PRD-28, Richmond 18, Va.

Electric and fuel-fired industrial heating equipment is covered in booklet 653A by Hevi-Duty Electric Co. Vertical retort and pit-type furnaces shown are for bright annealing nonferrous metals, and solution treatment and ageing of aluminum. Other items illustrated include box-type electric and fuel-fired furnaces, con-

KAISER ALUMINUM

ALUMINEWS

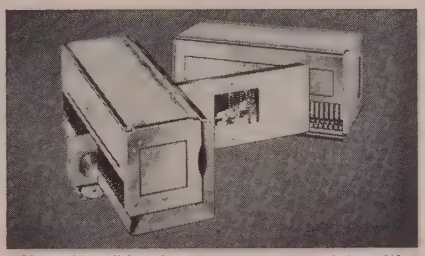
NEW PRODUCTS . . . NEW MARKETS . . .WITH KAISER ALUMINUM!

Airequipt Slide Changers Offer Fingertip Action For Quick, Easy Projection

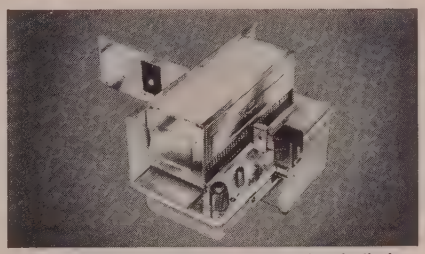
Airequipt slide changers are virtually all aluminum (alloy 5052-H32 sheet) for light weight, pleasant appearance and durability. Manual projectors can be converted to automatic slide operation with the Airequipt slide changer which changes slides in pre-selected sequence and automatically advances the magazine at the same time. This well known changer comes as original equipment on many of the world's finest and best known projectors.

For the ultimate in automation, Airequipt also produces an electric slide changer called *Electro-Changer*. Using the standard Airequipt aluminum magazine, the *Electro-Changer* operates electrically by itself, by push-button, or by remote control. It can be used with tape recorders that provide for slide-sound synchronization.

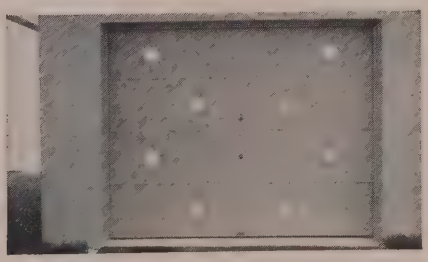
For complete information, mail the coupon below.



Airequipt slide changer comes complete with adapter and one magazine for 36 slides.



Airequipt Electro-Changer operates electrically by itself, by push-button, or by remote control.



Lifteez Doors Are 40% Lighter Than Standard Wood Doors

Lifteez Doors add beauty to any home. Their simplicity of design blends with any type of architecture. Also ideal for commercial and industrial use.

Lifteez Doors, manufactured by Burda Metal Industries, Inc., Hialeah, Fla., are made of heavy gauge, specially processed, stucco finish aluminum, bonded to a 1¾ inch-thick interior core of rosin-impregnated paper honeycomb. The result is a garage door 40% lighter than standard wood doors, yet strong and durable for rough usage.

The stucco aluminum finish on both sides is practical and attractive. The door won't warp, sag or rust—never needs painting, although it may be painted if desired. The honeycomb core offers insulating properties that save money on heat loss.

Other advantages gained through aluminum: weatherproof, resists moisture and decay; vermin resistant; fire retarding.

For complete information, mail the coupon below.

Please send me full information on the products checked below:

☐ Airequipt Slide Changers

☐ Lifteez Doors

Kaiser Aluminum & Chemical Sales, Inc.
Dept. P-175, Kaiser Center, 300 Lakeside Drive
Oakland 12, California

Name_____

Address_____

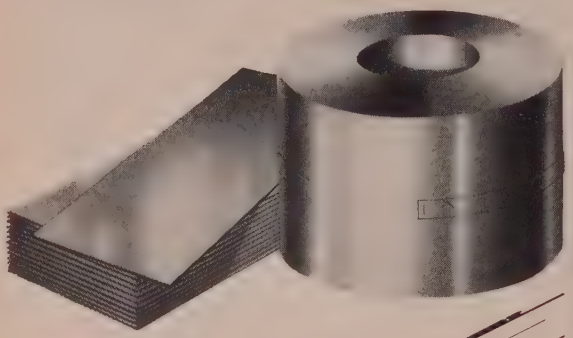
City_____ Zone____ State____

KAISER ALUMINUM*

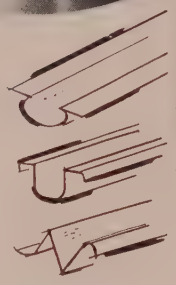
THE BRIGHT STAR OF METALS

*Trademark Kaiser Aluminum & Chemical Corp.

ALUMINUM coils and sheets



IN STOCK . . . coils for Slitting, Flat Sheets for Shearing. Wide range of Alloys and Tempers. Immediate Delivery— COMPLETE WAREHOUSE FACILITIES



GLadstone 5-7000

PRECISION STEEL WAREHOUSE, INC.
3500 N. WOLF RD. • FRANKLIN PARK, ILL.
(Chicago Suburb)

ALUMILITE
Sulfuric Acid Anodizing

Parts big or little, many or few

- 25 years experienced know-how can spell the difference between expensive and economical costs for you.
- Completely equipped for single job or contract work, with ample warehousing facilities, available to meet your production schedules on practically any size job.
- Send sample or drawing when requesting quotation.
- Anodizing to government specifications.
- Authorized licensee since 1932.
- It will pay you to know the Why, How and Where of Alumilite. Informative literature available.

Write Today

CITY PLATING & POLISHING CO.
DIVISION OF CIPCO CORPORATION
22nd & Cole Sts. St. Louis 6, Mo.

tinuous and pot-type furnaces. The hydrogen atmosphere furnace shown is for heat treatment and refinement of titanium and zirconium. Aluminum dry hearth melting furnaces, a holding furnace, and an automatic aluminum slug casting machine are also included. For copy write R. A. Cook, Hevi-Duty Electric Co., P.O. Box 563, Milwaukee 1.

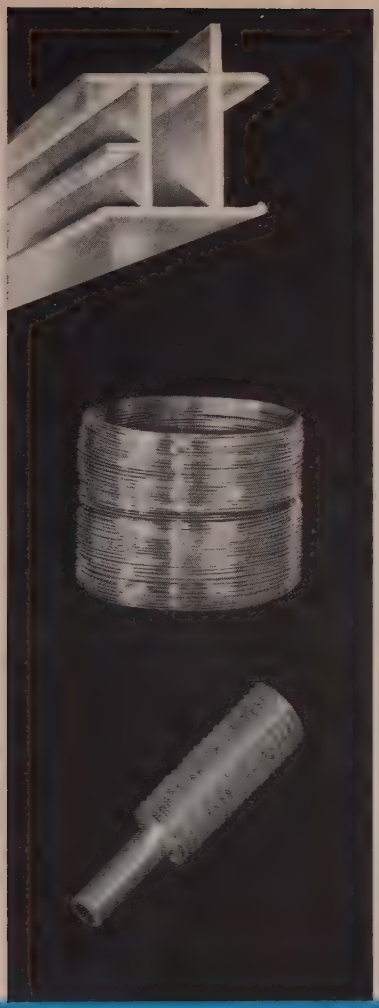
Aluminum mill products, their availability and proper selection, are covered in a 24-page manual prepared by Kaiser Aluminum. A table of general information lists applications, chemical composition, alloy, temper and mechanical and physical properties of wrought alloys. Wrought forms discussed include non-heat treatable, heat treatable, sheet, plate, foil, rod, bar, wire, extrusions and tubing. Photographs and text help explain various aspects of products. Also covered are casting alloys, forgings, extrusion billets, pig, fabrication and finishing. Detailed are domes, bridge railings, roofing and siding, cables, wire, and other building and specialty items. For copy of "Aluminum Mill Products" write Kaiser Aluminum & Chemical Sales Inc., Dept. NR-41, 300 Lakeside Drive, Oakland 12, Calif.

Billet heater Bulletin 598 from Ajax Magnethermic Corp. illustrates how to produce aluminum extrusions with an induction billet heater. The four-page booklet lists seven claimed advantages of the firm's heaters, has a chart explaining optional tapered heat pattern for aluminum billets and also discusses fuel costs. A copy can be obtained from Clarence C. Hanson, Ajax Magnethermic Corp., P. O. Box 839, 3990 Simon Road, Youngstown 1, Ohio.

A **refractory material,** Brikram 80, for lining aluminum furnaces is discussed in a pamphlet by General Refractories Co. The material is an 80 to 83% ramming mix used as the lining in the bottoms and lower side walls of aluminum melting and refining furnaces. Instructions on how to use the mix are included, as is a table listing properties. This includes chemical analysis, fusion point, weight, linear dimension change and modulus of rupture. For copy contact F. D'Olier, General Refractories Co., 1520 Locust St., Philadelphia, 2.

Better **offhand polishing** with coated abrasive belts is subject of publication by Behr-Manning Co. The fully illustrated booklet gives case histories and discusses fixturing, techniques to aid the polisher, and includes a job specifications chart for maximum production. Four company offhand polishing machines, and belts and contact wheels are shown and detailed. This 30-page booklet will be sent to you by contacting H. J. Lowe, Behr-Manning Co., 10th Ave., and 27th St., Watervliet, N. Y.

Salt bath furnaces developed jointly by Lindberg Engineering Co. and Upton Electric Furnace Co. for production or laboratory use are described in a new brochure. The various high and low temperature units in the line include furnaces for neutral hardening, high speed steel hardening, annealing, billet heating, solution heat treating, austempering, and martempering. Also described is a complete installation for aluminum



ALUMINUM IDEAS

BY

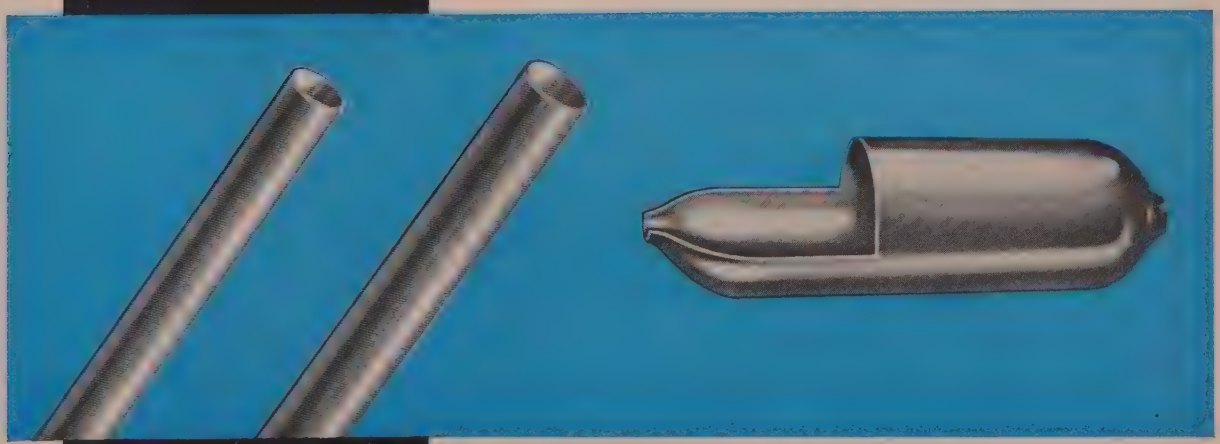
WOLVERINE TUBE

If your company is searching for a reliable aluminum tube source, why not try Wolverine Tube?

Here's a supplier with years of metalworking experience. Wolverine Tubes' product line is extensive and its adherence to quality control standards and customer specifications is second to none.

You can, for example, specify Wolverine in both drawn or extruded aluminum tube in prime surface form or with integral fins, in straight lengths, or in time saving long-length, bunch-type coils. If your requirements call for extruded aluminum shapes, Wolverine produces them to customer specifications. To insure its customers of complete aluminum service, Wolverine also maintains extensive spinning and fabrication facilities.

Wolverine's Aluminum Tube Catalog tells the complete story—is in addition, chuck-full of helpful information about this modern metal. Write for your free copy—TODAY.

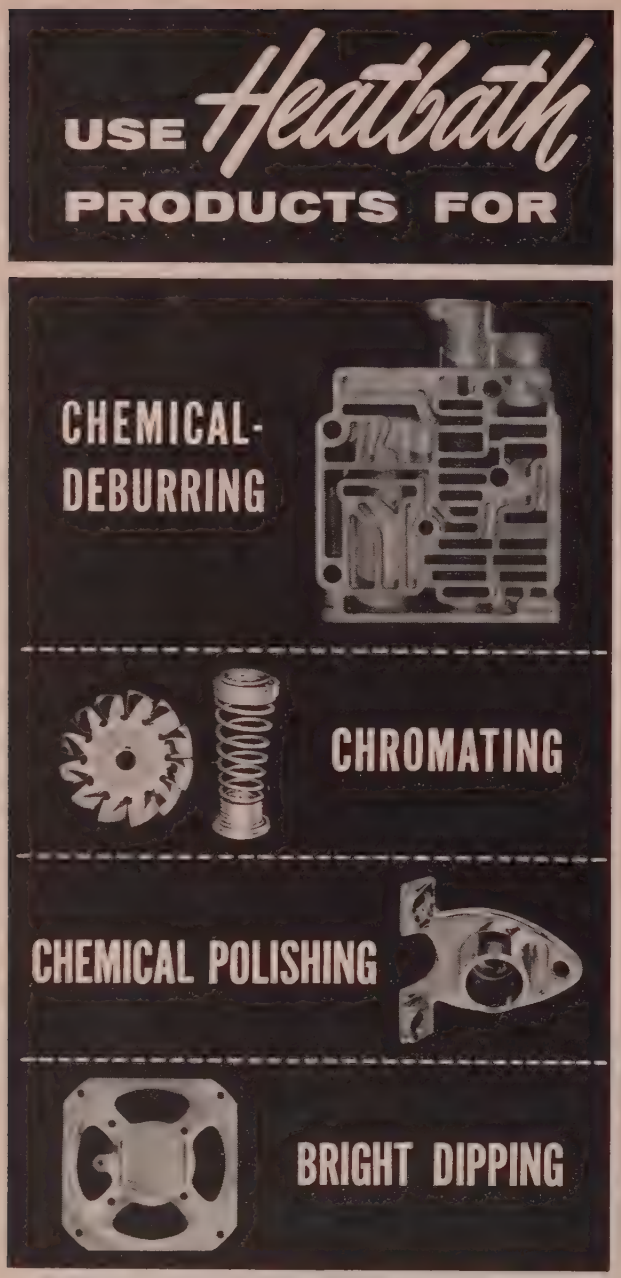


CALUMET & HECLA INC
CALUMET DIVISION
U-PANCOIL DIVISION
GOODMAN LUMBER DIVISION
WOLVERINE TUBE DIVISION

In Canada:
CALUMET & HECLA (CANADA) LIMITED
ALUMINUM FABRICATORS
CANADA CANNERS LIMITED
UNIFIN TUBE DIVISION

WOLVERINE TUBE
DIVISION OF
CALUMET & HECLA, INC.
17262 Southfield Road
Allen Park, Michigan

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA
SALES OFFICES IN PRINCIPAL CITIES



Heatbath has a complete line of tested and proven chemical finishing products for aluminum, magnesium, cadmium, zinc, copper, brass and other non-ferrous metals. This line includes materials for cleaning, etching, deoxidizing, deburring, polishing, bright dipping, chromating and surface protection. Send now for further information.

HEATBATH CORPORATION
SPRINGFIELD 1, MASSACHUSETTS
or 701 North Sangamon Street, Chicago 22, Illinois
38 Years of Service to the Heat Treating and Metal Finishing Industry

dip brazing. In this set-up the graphite electrode is advanced through the wall while furnace continues in operation. Cost is said to be 25 cents per electrode per month in aluminum dip brazing applications. For copy of Bulletin 151 write Miss A. McGeeney, Lindberg Engineering Co., 2450 W. Hubbard St., Chicago, 12.

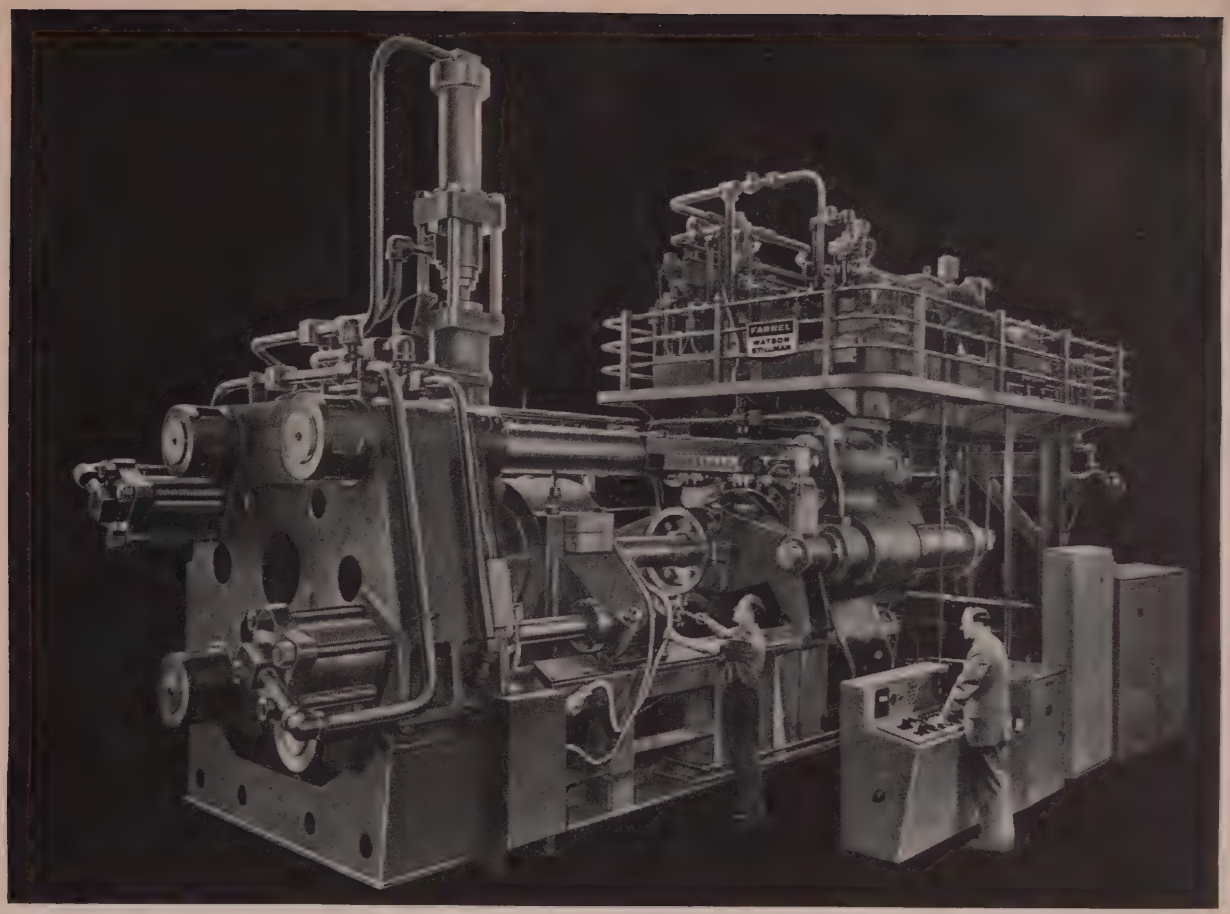
Furnaces and ovens for aluminum are illustrated and covered in brochure 128 by W. S. Rockwell Co. Shown are various types of equipment for melting, annealing, brazing, homogenizing, preheating, solution treating, cleaning, washing, drying, and baking organic finishes. Equipment can be used for ingots, billets, slabs, cakes, plate and sheet, coiled sheet, strip and foil, straight and coiled tube, and for extrusions, forgings, castings and stampings. For publication write C. B. Kentnor, W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.

Aluminum pig and ingot by Alcoa, and the broad consulting service available to foundries in the selection of aluminum casting alloys, are discussed in a new brochure. To simplify selection, tables included cover: Which alloy to use for various casting operations, mechanical properties of typical alloys, alloy composition limits, and common uses of castings made from various alloys. Manual can be had by writing Aluminum Co. of America, 726 Alcoa Building, Pittsburgh 19.

Revere primary aluminum casting alloys, their composition and physical and mechanical properties, are detailed in an eight-page brochure published by Asarco. Included in brochure are tabulations of the nominal composition of sand, permanent mold and die casting alloys. Also included are tables on fluidity shrinkage, machinability and corrosion resistance, tensile, yield and shear strength, elongation and hardness. The physical properties listed encompass specific gravity, density, melting range and electrical and thermal conductivity. Copies may be obtained from E. Friedlander, Federated Metals Division of American Smelting and Refining Co., 120 Broadway, New York 5.

Aluminum tubing is subject of illustrated booklet prepared by Pfister Aluminum Corp. Company services are listed and various products shown. Tube properties and chemical composition of nine alloys are given. Also included is an aluminum weight table, decimal equivalents of common fractions, equivalents for wire, tubing, sheet metal gauges, and other tables of interest and value to aluminum tubing users. This pamphlet is available from F. W. Pfister, Pfister Aluminum Corp., 54 W. Allendale Ave., Allendale, N. J.

New germanium rectifier line of Hanson-Van Winkle-Munning Co. is described in Bulletin ER-110, which gives power ratings, voltages and physical dimensions of the four models. Special advantages and features are listed. Germanium junction diodes are also illustrated. H-VW-M's Robert Norton, Matawan, N. J., will send this folder.



Press being tested under dry run conditions prior to shipment.

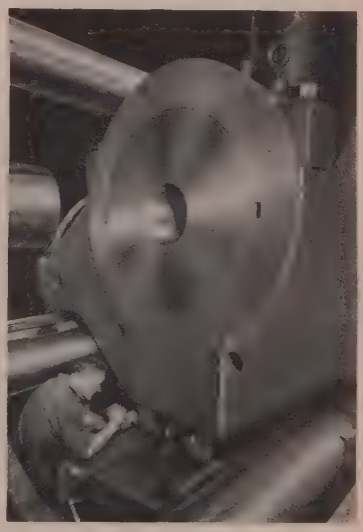
3300-ton press extrudes solid or hollow billets at high speeds

This huge Farrel Watson-Stillman press extrudes 12″ diameter x 32″ solid or hollow billets at ram speeds of 47″ and 57″ per minute respectively.

The container housing system has a separate holding pump—assuring positive container sealing at all times. Container cylinders have a 20-inch stroke, which allows ample room for dressing dies in the press, reducing non-productive downtime. The press is equipped with a fully automatic bridge cycle.

For all its 3300-ton capacity (it can be operated at 3500-tons for breakthrough on tough alloys), the press is easy to operate and maintain. The double die-slide feature simplifies die changing: A complete tooling stack can be placed in the slide while the press is running. New two-piece container housing facilitates container removal.

Write for description and specifications of a press to meet your requirements. Capacities range from 60 to 6,000 tons in standard and special designs.



Workman makes final adjustment on the container housing.

FARREL-BIRMINGHAM COMPANY, INC.
WATSON-STILLMAN PRESS DIVISION

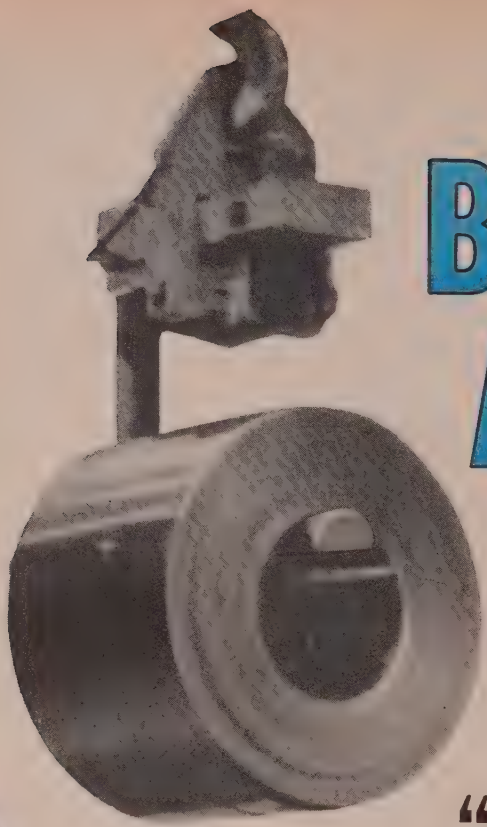
571 Blossom Road, Rochester 10, N. Y. • *Telephone:* BUtler 8-4600

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

Manufactured in Canada by: Canadian Vickers Limited

FARREL WATSON STILLMAN ®

WS-72



BRIDGEPORT ALUMINUM SHEET

GIVES YOU "COST-SAVING EXTRAS"

Now you can order quality aluminum coiled or flat sheet from Bridgeport's warehouse stocks. It's available in a wide range of common commercial alloys (non-heat-treatable) up to 24" wide in most finishes. Bridgeport's modern production equipment and techniques, based on long experience, turn out products that can be relied upon for "cost-saving extras."

EXTRA UNIFORMITY of gauge and tolerances eliminates numerous time-consuming press adjustments . . . assures longer tool life. You get extra quality in every square inch of your Bridgeport Aluminum sheet.

EXTRA FINE FINISH, a "must" at Bridgeport, gives your product additional "selling appearance."

EXTRA LONG COILS for cost-saving special applications—ideal for fin stock, etc. Continuous unspliced coils within mill limits may be obtained which are well over three miles in length.

EXTRA SERVICE includes not only delivery of precisely what you specify on the dates agreed upon, but custom slitting as well. Top technical service is a well-known Bridgeport specialty.

BRASS Bridgeport CO.

BRIDGEPORT BRASS COMPANY

Bridgeport 2, Connecticut

Specialists in Metals from Aluminum to Zirconium

Bridgeport Warehouses Located At: CHICAGO: LAfayette 3-2230 • CLEVELAND: CEdar 1-5180 DENVER: CHerry 4-3308 • ST. LOUIS: CEntral 1-0076 • DALLAS: RIverside 1-4859 • LOS ANGELES: RAymond 3-5101 • HILLSIDE: BIgelow 3-0044 • NEW YORK: EXeter 2-4290 • PHILADELPHIA: JEfferson 5-3900 • PROVIDENCE: WIlliams 1-2100 • SAN FRANCISCO: UNderhill 1-2551

Write Department 1402 for this free Warehouse Stock List.

3 good reasons

WHY YOU CAN RELY ON

ROGERS INDUSTRIES INCORPORATED

FOR ALL YOUR

ALUMINUM EXTRUSIONS

1 ENGINEERING CONSULTATION

Rogers' skilled engineering staff specializes in solving production problems—developing improvements for the extrusions you now use, and *new* cost-saving applications you may have overlooked.

2 QUALITY CONTROL

Rogers' production experience and inspection techniques assure you fine quality Extrusions . . . strict adherence to close tolerances and good finishes.

3 HUGE INVENTORY —PRESS CAPACITY

Rogers maintains full stock at all times, provides multiple-press operation for complete, dependable service. Fleet of Roger's trucks assures prompt delivery.

EXTRUSION DIVISION

ROGERS INDUSTRIES INCORPORATED

(formerly Winter-Seal Corp.)

14575 Myers Road • Detroit 27, Michigan

New Enterprise

Eating ware **cleaning equipment** must necessarily be rust-proof and not retain odors. For these reasons Steril-O-Matic Co., Inc., 4530 N. Keystone Ave., Indianapolis, Ind., has chosen aluminum for use in some of its silver cleaning accessories. Two models of cylinders and baskets are made of the light metal.

As the television screens get larger, the units themselves get smaller and lighter in weight. Setchell Carlson Inc., New Brighton, St. Paul, Minn., has come out with a 17-inch **portable T.V.** with an aluminum chassis and cabinet which is covered with plastic coated fabric. It weighs only 31½ pounds and is only 8½ inches deep. Aluminum chassis is a standard feature of all the firm's monophonic-stereophonic T.V., radio and record player combinations.

Two new polydiesel **marine engines** which can operate on "almost any hydrocarbon," according to Hercules Motors Corp., Canton, Ohio, have been developed for both pleasure and work boats. The larger of the two is a 255 h.p. vertical aluminum V-8 engine weighing 1,540 pounds. Hercules says this is 1,000 pounds less than conventional Diesels.

A Racine, Wis., farm and construction machinery firm started to make **prefabricated buildings** for its dealers but has now entered the field commercially. The J. I. Case Co. has set up a subsidiary, headed by J. H. Brinker, to market the prefabs. They will be flat, one-story units that can be used for stores, auto agencies, manufacturing, etc. Framework will be steel girders, with aluminum or steel curtain walls possibly combined with brick. Most of the materials will be bought from outside suppliers, but Case will manufacture joining equipment.

Fulton Cotton Mills, Inc., Atlanta, Ga., has purchased the Ainsworth Precision Division of Harsco Corp., Harrisburg, Pa., in a **cash transaction.** The division's five plants produce stampings, die castings and machine parts for many industries, including automotive. Fulton makes fabrics for automotive use.

A new **phenolic laminate,** TRC-X, reinforced with glass fiber, is said to retain its strength, dimensions and dielectric properties for several minutes at temperatures over 1,000°. It is produced by Riverside Plastics Corp., Hicksville, N. Y., who says product is suitable for use in missile printed circuits and radar equipment subjected to heat from air friction. The firm also says TRC-X is strong enough to replace metal parts in missiles and can be bonded to aluminum as insulation.

Color and aluminum seem to be an increasingly popular couple recently. Bestile Mfg. Co., Ontario, Calif., has developed a new line of colored aluminum **building panels** especially designed for patio and porch roofs. It is made from Kaiser Diamond-Rib sheet or standard

EFFICIENT FOIL ANNEALING *thru* DISTINCTIVE DESIGN

lanly

FEATURING:
Gas Tight Construction,
Indirect Fuel Firing,
Forced Cooling, and
Oxygen Free Atmosphere.

The advantages of annealing flat rolled aluminun of all gauges in a non-oxidizing atmosphere have been recognized and accepted in modern practice.

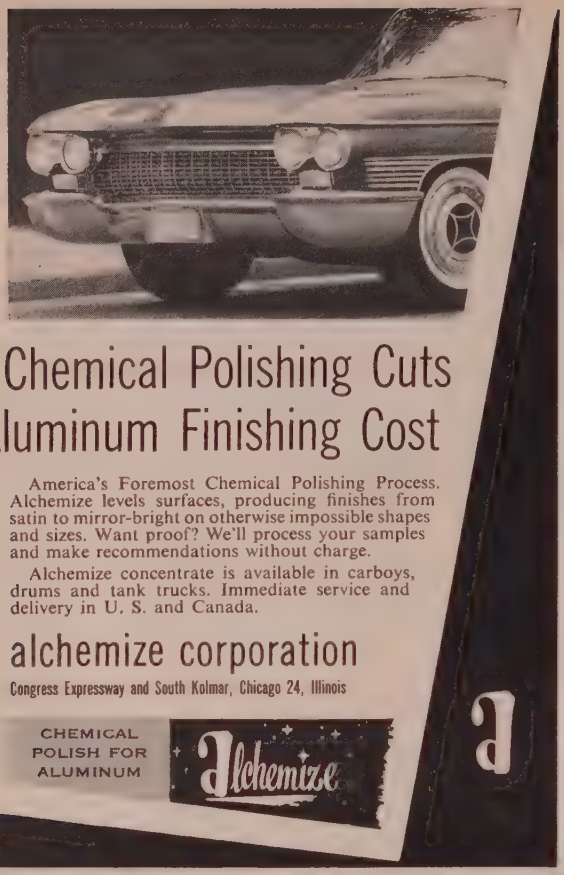
Lanly solicits inquiries for completely engineered equipment either immediately needed or contemplated.

Lanly Bulletin "Light Metals" is available upon written request.

Find Your Representative In The Yellow Pages

THE lanly COMPANY • LIGHT METAL OVENS
2800 Euclid Avenue • Cleveland 15, Ohio

Atlanta, Georgia • Birmingham, Ala. • Boston, Mass. • Chicago, Ill. • Cleveland, Ohio
Toronto, Ontario • Columbus, Ohio • Detroit, Mich. • Buffalo, N. Y.
Pittsburgh, Pa. • Rochester, N. Y. • San Francisco, Calif. • St. Louis, Mo.


Chemical Polishing Cuts
Aluminum Finishing Cost
America's Foremost Chemical Polishing Process. Alchemize levels surfaces, producing finishes from satin to mirror-bright on otherwise impossible shapes and sizes. Want proof? We'll process your samples and make recommendations without charge.
Alchemize concentrate is available in carboys, drums and tank trucks. Immediate service and delivery in U. S. and Canada.
alchemize corporation
Congress Expressway and South Kolmar, Chicago 24, Illinois
CHEMICAL POLISH FOR ALUMINUM
Alchemize

It's ATLANTIC for
QUICK DELIVERY at LOW COST of
ALUMINUM BRASS COPPER
. . . and ATLANTIC gives you, and over 3000 satisfied customers, all these other advantages!
• Exacting Specifications • Low Price
• Over 2,000,000 lbs. of Aluminum, Brass and Copper always in stock
• SHEET • COIL • CIRCLES • ROD • BAR
• TUBE • STRUCTURALS • TOOL AND JIG PLATES • EXTRUSIONS
CALL ATLANTIC COLLECT for Quotations and Complete Details
ATLANTIC ALUMINUM
& Metal Distributors, Inc.
Main Office and Warehouse
PAGE BOULEVARD • SPRINGFIELD, MASS., PHONE: REpublic 9-9611
Branch offices PHILADELPHIA • CLEVELAND • NEW YORK

embossed corrugated aluminum roofing sheet. The panels are finished on the interior side in colored baked plastic, while the exterior has factory applied green pre-paint treatment. Panels are available in coral, green, yellow, bronze, orange and tan. Diamond-Rib sections come 50.3 inches wide and 8, 10 or 12 feet long, while embossed corrugated sheet comes in 26-inch widths.

Aluminum **ductwork** has won out over galvanized steel — at least with one manufacturer. Maxwell Steel Div'n of Creamer Industries, Inc., 3209 Galvez, Fort Worth, Tex., has started production of prefabricated aluminum ductwork for residential use, and has discontinued the manufacture of its galvanized line. "We feel we can make a more attractive line of prefabricated ductwork and fittings with aluminum now that new types of ductwork sheet make aluminum fully competitive in price with other metals," asserts A. G. Nauert, Maxwell vice president.

Jaeger Machine Co., 550 W. Spring, Columbus Ohio, recently introduced a new 7 cubic foot **truck concrete mixer** which can carry 16% more payload because of its weight-saving aluminum framework and mounting. "The aluminum parts reduce deadweight of the new unit by 1500 to 1600 pounds, enough to increase payload by almost one-half cubic yard," says E. L. Baugh, Jaeger's truck mixer sales manager. "This means that heavier payloads can be carried within the limits of state road gross weight laws.

Gracious living, via a touch of gold and patterned aluminum sheet, has crept into a new line of partitions for dressing, shower and **rest room compartments** developed by General Welding and Fabricating Co., 1702 Peninsula Drive, Erie, Pa. Sandwich panels are finished on both sides with gold-anodized 0.038-inch aluminum sheet over a core of high-strength paper honeycomb. Motif is continued on hardware with all fittings and other trim finished in natural polished aluminum. The gold sheet has a small rectangular pattern for added luster.

Aluminum Industries, Milwaukee manufacturer of aluminum **combination doors and windows,** has opened a new plant at 7876 Portland Ave., Bloomington, Minn. The 15,000 square-foot facility is managed by William Morris, Jr.

Aluminum racing yacht spars, complete with masthead fittings, are being produced by Merriman Bros. Inc., 185 Armory, Boston. Spars come in 26, 30, 40, 48, 52 and 60-foot heights.

Appleby Mfg. Co., Richland, Mo., specialists in the manufacture of aluminum **fishing boats,** have purchased a new plant on Highway 64 in Lebanon, Mo. Production is expected to begin this spring.

Tote Tilt is a newly designed aluminum **stationary hopper** with stainless steel screw flight — manufactured by Tote System Inc., Beatrice, Neb. It converts her-

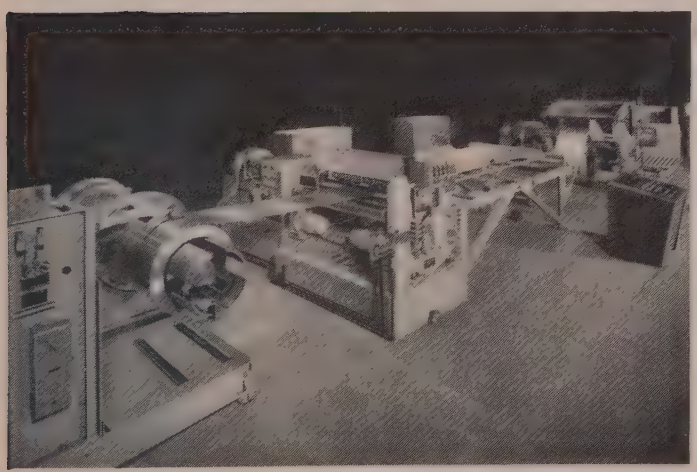
ARE YOU ON THIS MAP?

AND USING ALUMINUM COILED SHEET?

WHY NOT GET PERSONALIZED SERVICE FROM PEOPLE WHO REALLY APPRECIATE YOUR BUSINESS...

SHEET ALUMINUM CORPORATION

ONE OF AMERICA'S OLDEST AND MOST EXPERIENCED CUSTOM ROLLERS



Overall view of new Voss "coil leveling line" for production of siding quality aluminum up to 48" wide. Modern equipment such as this means better quality aluminum from Sheet Aluminum Corporation.

It's hard to beat the combination of personalized attention from a small, experienced company that possesses some of the biggest and best equipment in the industry. You get top quality aluminum and you'll always be certain that your specifications will be met.

Sheet Aluminum Corporation operates a modern 4-Hi rolling mill . . . a new 48" Voss Leveler and matching units to custom roll aluminum to any thickness from .006" to .102" in coil or sheet . . . widths from 3/8" to 48". A wide range of alloys include 1100, 3003, 5005, 5050, 5052, 5357 and 5457.

On your next order for coil or strip aluminum, get personalized service . . . faster service . . . better service . . . from one of America's most experienced and best equipped custom rollers . . . SHEET ALUMINUM CORPORATION.

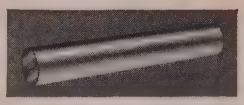
Write today for our new Facilities Bulletin.

SHEET ALUMINUM CORPORATION JACKSON 90, MICHIGAN

A SUBSIDIARY OF THE MUELLER BRASS CO.

THE LOW COST WAY IS WALLACE "CUT-MACHINING"

Our customers have told us on straight cut-offs, of aluminum or other non-ferrous pipes, tubes, bars and extrusions, there is nothing faster than Wallace "Cut-Machining."

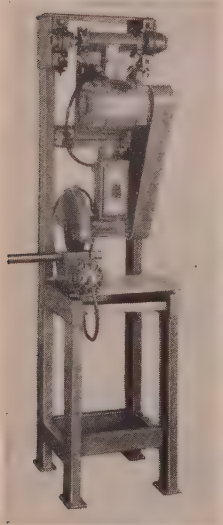


One company reports cutting 1600 pieces per hour from 3/4" O.D. aluminum—pieces 6 13/16" long

HIGH LINEAL TOLERANCE PLUS 2 "LIKE POLISHED" ENDS

Lineal tolerance is guaranteed ± .010. This high degree of precision can be obtained day after day with inexperienced help. The small random cut at the left showed only .002" variation. Both cut ends had an approximate 45-55 micro finish.

THIS WALLACE UNIT DESIGNED FOR LIGHT METALS



It is a swing type saw with jaws of pneumatic vise synchronized with swing movement of circle saw. The instant the saw is pulled forward, jaws clamp shut — when released, jaws instantly open.

GET THE FACTS SO YOUR COSTS CAN BE REDUCED

Send for Wallace Cut-Machining literature or if you prefer, tell us about your specific problem.

CALL COLLECT

BUckingham 1-7000
CHICAGO

F R E E

8 oz. sample E-Z Coolant or Bend E-Z. Letterhead requests only. Tell us what you cut or bend. Our own formula—it's the best.

We Have Had 64 Years Building Quality Machinery

WALLACE SUPPLIES MFG. CO.

1808 West Cornelia Ave. • Chicago 13, Illinois

metically sealed Tote Bins into discharge hoppers by tipping them to a 45° angle. With the air cylinder stationary hopper tilt, the discharge mechanism remains in fixed position and the bin automatically is elevated to make contact with the gasketed dust-tight hopper.

Drapery draw rods, usually a functional item, are also decorative if purchased from Consolidated Trimming Corp., 27 W. 23rd St., New York 10. The Conso Evergold rods are of gold anodized aluminum and have transverse mechanisms and cords hidden from view. The 1 inch round rods come with brackets, finials and rings. Three extensions are available to cover window areas from 30 to 150 inches.

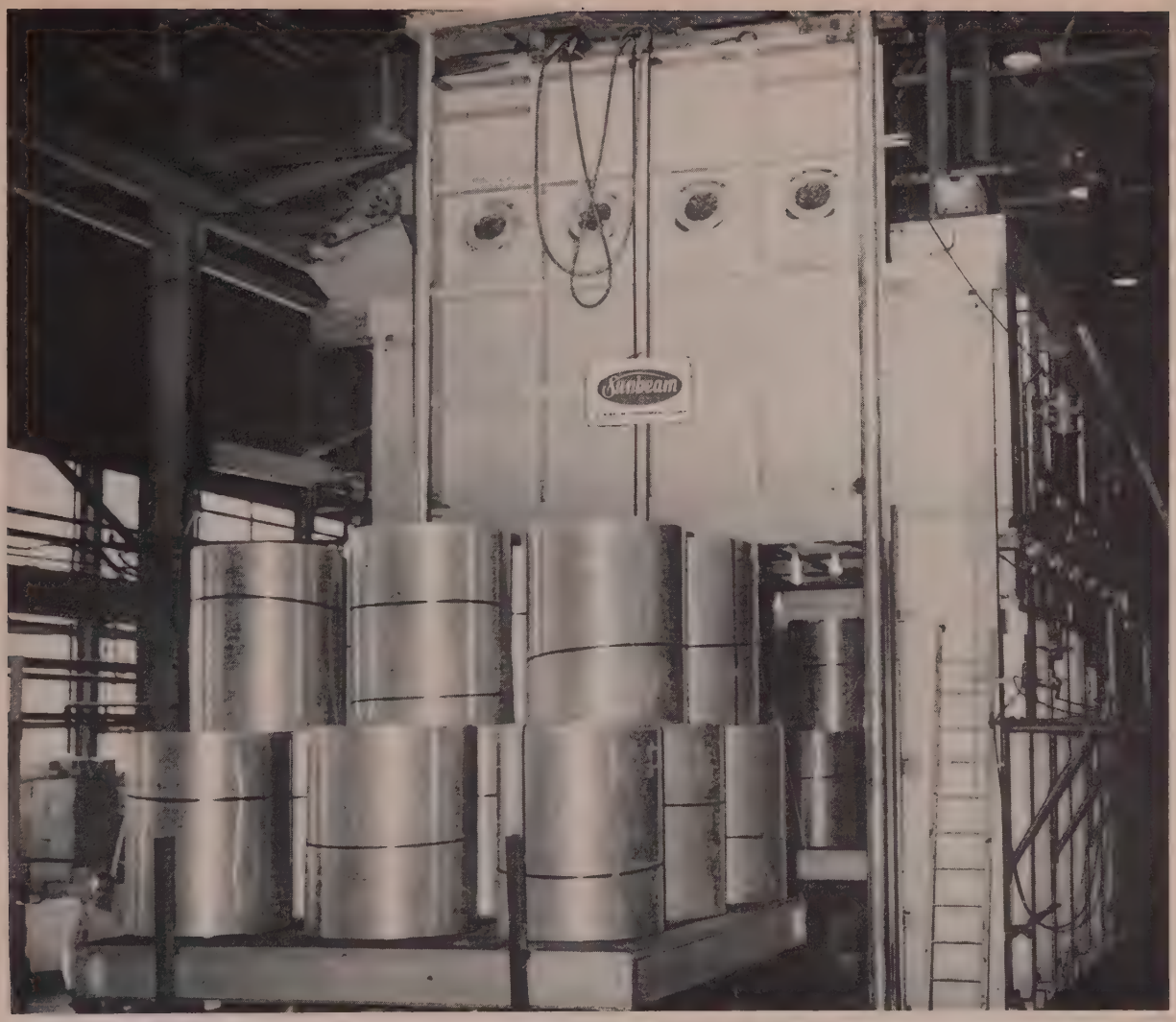
Poppers Supply Co., 1211 N. Second St., Philadelphia 22, has devised an all-aluminum **pizza-warmer** that can double as a merchandising display case. The front glass slants to aid visibility. Aluminum racks in the two and three-decker models are removable for quick loading.

Modern sculptured aluminum and intricately woven tropical rattan are combined in the outdoor **furniture** line of Telescope Folding Furniture Co., Inc., Granville, N. Y. Tubular aluminum is used for framework while the woven rattan and carved wood armrests add warmth and texture.

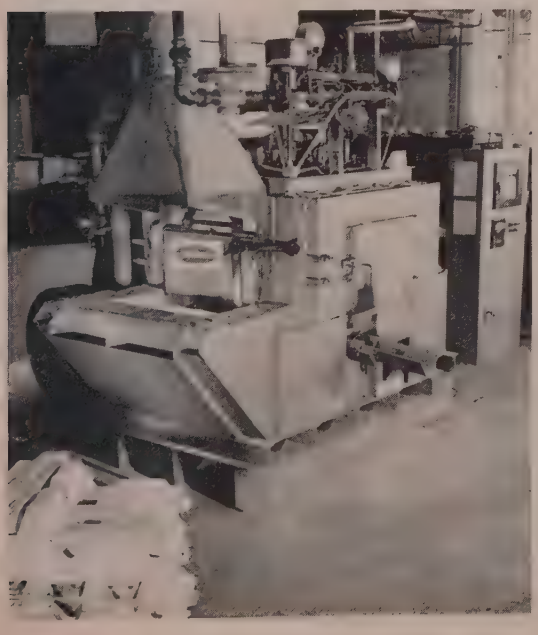
James Booth Aluminium Ltd., Birmingham, England, has taken its initial step in a long range £5 million ($14 million) **expansion and re-equipment** project. The firm has ordered a new rolling mill from Loewy Engineering Co., Bournemouth, England, at a cost of £1.5 million ($4.2 million). Said to be the largest mill in Western Europe, it will roll aluminum and duralum slag ingots weighing up to six tons when it begins operation next year. Other new equipment will be ordered soon, so the firm can roll larger sheet and plate.

Aluminum has been put to use to provide early shows for patrons of the Sunset Drive-in Cinema at Wynberg, South Africa. A cantilever-supported **canopy,** roofed with aluminum sheet, shades the screen from the sun. Extruded sections are used to support the screen, which is said to withstand wind gusts up to 110 mph.

The Beryllium Corp., Reading, Pa., has completed a 12,000-square-foot expansion of its beryllium fabrication division at Hazleton, Pa. The new capacity is provided by three vacuum hot press furnaces which will permit production of **beryllium components** in sizes from 6 inches up to 45 inches in diameter by 60 inches long. Lawrence Boland, vice president, says this will take care of the increased demand for beryllium parts by aircraft and missile manufacturers. This expansion marks the first major entry of the company into the commercial beryllium fabrication business. The firm is also planning a joint venture in Great Britain to construct there the largest beryllium plant in the world.



FROM ONE EXTREME TO ANOTHER



Aluminum heat processing requirements differ. The Melting Furnace to the left is just right for melting small aluminum ingot. But it's a far different story with the 225,000 pound load of aluminum coil pictured above.

Between these two extremes lie all kinds of requirements. To meet the broad range of needs, Sunbeam makes every type and size of furnace equipment for processing aluminum.

This range of experience can be invaluable to you in planning for your own aluminum processing furnace requirements. Your near-by Sunbeam Representative is well qualified to help you. We'll be glad to put you in touch with him.

The best industrial furnaces made

. . . are built by Sunbeam

SUNBEAM EQUIPMENT CORP.

196 Mercer St. Meadville, Penna.

DOW | *Now in magnesium and aluminum*

PRECISION MAGNESIUM EXTRUSIONS (inset) form two key parts for hydraulic paper cutter.

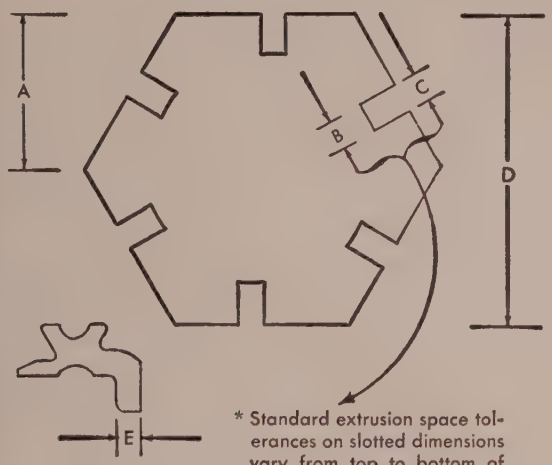
PRECISION EXTRUSIONS

tighten tolerances, cut costs

Paper cutter manufacturer slices production costs by replacing all-milled components with magnesium precision extrusions boasting tolerances as close as ± 0.0025.

Precision magnesium extrusions—a recent development of Dow's Madison, Illinois plant, deliver a big assist in the design of parts that must be extremely accurate and dimensionally stable. A wide variety of precision parts can be extruded with substantial savings in scrap loss, machining and setup time.

Harris-Seybold Company, a division of Harris Intertype Corporation, puts these advantages to work in the manufacture of hydraulic paper cutting machines. Results: six different machining and allied operations eliminated . . . machining and setup time for two key parts reduced by 64% and



* Standard extrusion space tolerances on slotted dimensions vary from top to bottom of the slot, depending on depth.

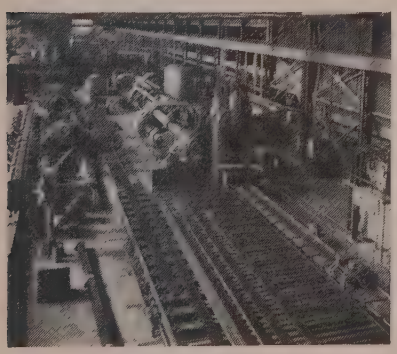
TOLERANCES HELD ON PRECISION MAGNESIUM EXTRUSIONS

Critical Dimension	Standard Extrusion Tolerance	Precision Extrusion Tolerance
A	± 0.012	± 0.0025
B*	± 0.007	+ 0.003 — 0.000
C*	± 0.012	+ 0.003 — 0.000
D	± 0.024	± 0.005
E	± 0.007	+ 0.000 — 0.003

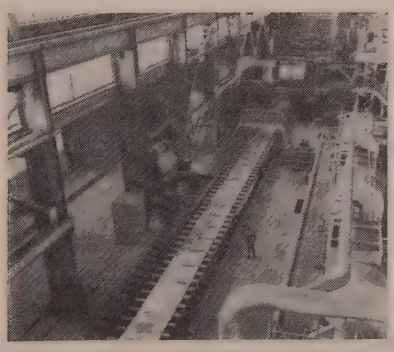
78%. Basic material costs were also lowered. The metal previously used was supplied in a high-property alloy in order to minimize warpage during the extensive machining operations. The standard magnesium alloy now used costs less. In addition, straightening operations required with the previous metal are no longer necessary.

The two parts Harris-Seybold now buys as precision magnesium extrusions serve to position the paper correctly for a number of successive cuts. They range from 46 to 106 inches in length and must be both dimensionally accurate and free of kinks and bows. No machining of these extruded parts is required after they are received in the Harris-Seybold plant.

For facts and figures about precision magnesium extrusions as they apply to your requirements, write to THE DOW METAL PRODUCTS COMPANY, Midland, Michigan, Sales Dept. 1050CQ3.



GIANT EXTRUSION PRESS, used to extrude magnesium and aluminum, produces sections up to 30-inch circumscribed circle. This 13,200 ton press extrudes large structural shapes of magnesium and aluminum for aircraft and missile parts, other applications.



ROLLING MILL at Madison, Illinois is the largest in the world for magnesium alloys. Flat sheet and plate and coiled sheet are produced in a wide range of sizes. Extra flat tooling plate for all tooling uses is also produced at this plant.

HOW MAGNESIUM PRECISION EXTRUSIONS CUT SETUP AND MACHINING TIME

PART AND MATERIAL	OPERATIONS REQUIRED	TOTAL SETUP & MACHINING TIME
Spacer Bar:		*10 pieces per production run*
Previous Metal	8	1,750 minutes
Magnesium Precision Extrusion	5	626 minutes
Stop Carrier Strip:		*60 pieces per production run*
Previous Metal	8	2,399 minutes
Magnesium Precision Extrusion	5	510 minutes

OPERATIONS ELIMINATED BY MAGNESIUM PRECISION EXTRUSIONS

Spacer Bar	Stop Carrier Strip
1. Straightening	1. Straightening
2. Milling slots	2. Milling critical dimension
3. Burring slots	3. Straightening

THE DOW METAL PRODUCTS COMPANY, Midland, Michigan

See "The Dow Hour of Great Mysteries" on NBC-TV

A Division of The Dow Chemical Company

'Price squeeze' charge renewed . . . as Aluminum Extruders Council urges three primary producers to lower pig price in U.S. to the rate charged in foreign markets. Producers defend dual structure; say present domestic price barely covers cost of research, development, promotion.

DISCRIMINATORY pricing by the U. S. primary aluminum producers threatens to drive the independent extruders out of business. So says a sharply worded complaint released early this month by the Aluminum Extruders Council, an association of 29 independent extruders.

The complaint contended that Alcoa, Reynolds and Kaiser were guilty of:

1. Selling aluminum abroad for lower prices than in the U. S.

2. Jacking up the price of pig without giving mill products a similar boost.

Long-Smouldering Dispute

Evidently, the first charge serves as a "peg" for the second, since the dispute over the relative prices of pig and mill products has been smouldering for some years. At any rate, the Extruders Council pointed out that Alcoa, Reynolds and Kaiser are charging European buyers 23¼ cents a pound for pig delivered to foreign ports, while U. S. customers pay 26 cents a pound.

"This discriminatory price policy endangers the independent aluminum extruders' business," the AEC contended. In a letter to the three producers, the Council asked that aluminum buyers in the U. S. be charged the same price as foreign buyers.

With this matter out of the way, the Extruders Council got down to its main charge — that the primary producers are squeezing the profit margins of the independents by manipulating the price relationship between pig and mill products.

"Fabricators of aluminum make extrusions and other products," the complaint explained. "So do their suppliers of raw metal, the three large U. S. producers. . . . These companies, by raising the price of the raw . . . aluminum more than they raise the price of the fabricated product, squeeze the margins of the independents."

By way of proof, the AEC noted that back in 1949 the producers charged 16 cents a pound for aluminum pig and 40.4 cents for the most common extruded shape, while in January 1960 the price for pig was 26 cents and the extrusion price stood at 45.7 cents. Thus, the working margin had skidded 4.7 cents a pound — from 24.4 cents in 1949 to 19.7 cents in 1960.

The association interprets this as indicating that "the Big Three are deliberately trying to force the independent extruder out of business."

To buttress its argument, AEC further charged that the price of pig has gone up faster than the cost of producing it. "Alcoa's cost in 1949 was 10.94 cents a pound, Reynolds' was 11.44 cents, and Kaiser's was 11.53 cents," the report noted, pointing out that raw materials and power accounted for more than half of this.

"Total costs of producton had gone up about 3 cents a pound by 1956, accordng to the data of the Yates Committee, but the producers had boosted their price 8 cents a pound — from 16 cents to an average, in 1956, of 24 cents a pound . . . Today the price is up 10 cents a pound and costs are up, at most, 4 cents," the complaint charged.

The extruders contend that the cost of fabricating has risen "much faster" than primary production costs but that the price charged for fabricating has been cut 4.7 cents since 1949.

"The independent extruder has been able to hold on by a high degree of specialization and intense cost cutting," the Council claimed." The extruder's ability to continue holding on is disappearing. . . .

"Aluminum extruders believe that if they can get raw metal at the price U. S. producers sell to their foreign customers they have a chance for survival. It will not put them on an equal footing but their greater efficiency will make the difference."

Alcoa, Reynolds Reply

Two of the producers, Alcoa and Reynolds, issued replies, but they confined their comments to the gap between domestic and export prices.

Alcoa said that it was not the major supplier in Europe, that it does not establish the price of primary metal in Europe, and that it must sell competitively or not at all in that area.

"Failure to take advantage of sales opportunities in foreign markets at prevailing prices there would result in decreased domestic production, higher costs, and possibly higher prices to domestic consumers," Alcoa said.

The company feels that the price of primary pig in the U. S. is already too low to support the producers' research, development and promotional efforts to develop new markets for aluminum and to increase existing ones. All of these costly efforts, Alcoa added, are of direct or indirect benefit to the independent extruder.

David P. Reynolds, executive vice president of Reynolds Metals Co., pointed out that as long as U. S. capacity is not fully used, "we must seek markets outside our country. . . . We cannot sell pig in an overseas market at more than the price in that market."

Reynolds further pointed out that the present 26-cent price for pig is exactly what it was two years ago; that "it does not in any part compensate for recent wage increases or for increases in material costs. . . ." He added his opinion that the policy of low prices has expanded the markets for aluminum, thus benefiting the U. S. consumer "and the extruder industry."

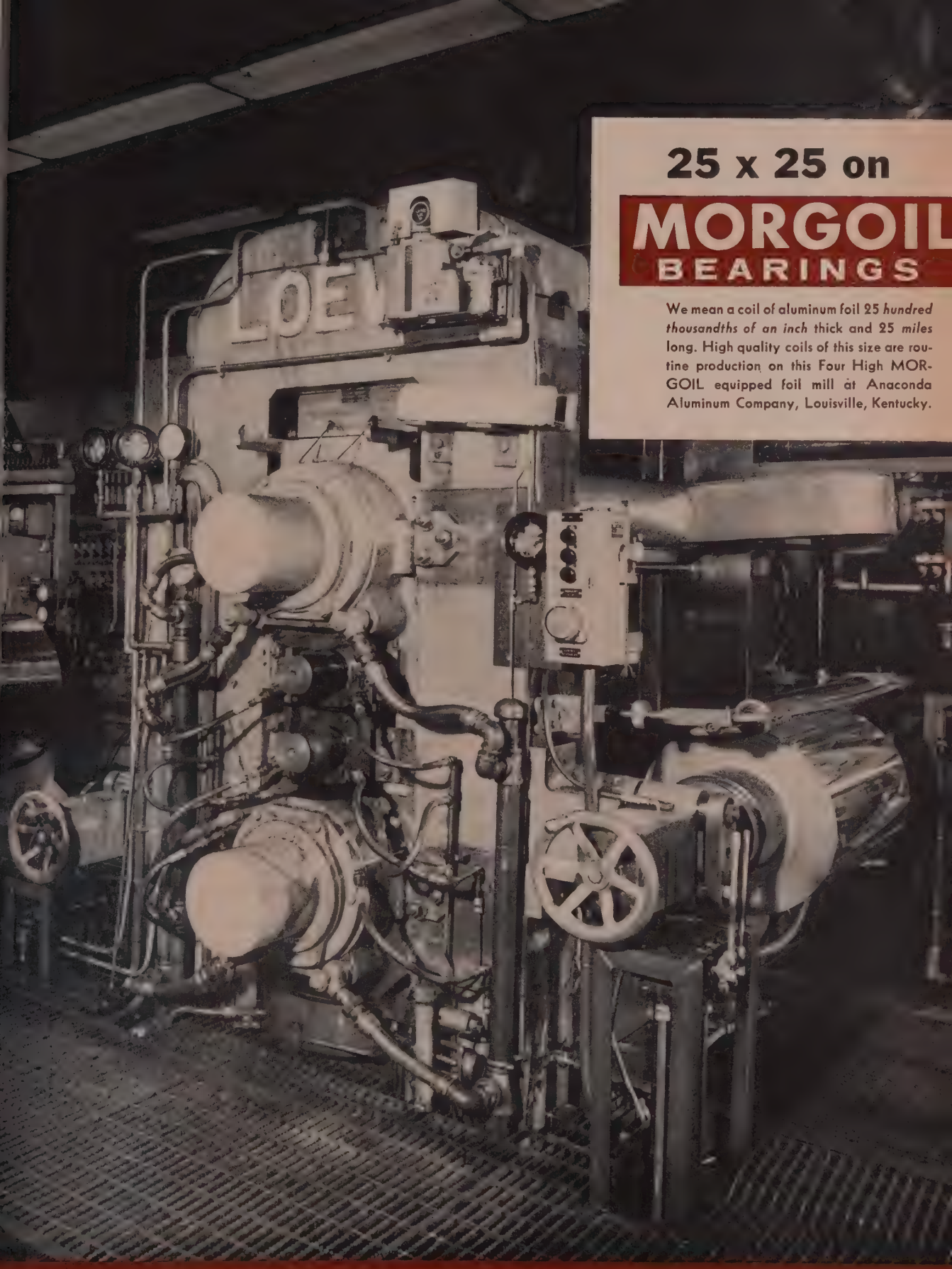
"Bring U. S. Price Down"

These replies did not sway the Extruders Council, whose rebuttal said that the producers "implied that AEC asked them to bring the foreign price up to the U. S. 26-cent price. The AEC does not oppose the 23¼-cent price to foreign buyers, but asks that its members and other U. S. fabricators also get that price."

AEC's rebuttal amplified the charges in the original complaint. Noting Reynolds' statement that the recent price increase did not compensate for recent wage increases, the AEC replied that the increase brings the price of pig "up to the excessive high price of two years ago," and asserts that "it provides a profit margin so high that it permits the Big Three to sell their fabricated products at less than cost."

On this basis, the AEC branded as "misleading" the Alcoa statement that "the price of primary pig in the U. S. is already too low to support the extensive research, development and promotional efforts being made by all U. S. producers. . . ."

On the contrary, the AEC contended, "The U. S. fabricator is bearing all the promotional, development and research costs . . . All these costs are actually carried by the raw aluminum income, not Big Three fabricating income."



25 x 25 on MORGOIL BEARINGS

We mean a coil of aluminum foil 25 *hundred thousandths of an inch* thick and 25 *miles* long. High quality coils of this size are routine production on this Four High MORGOIL equipped foil mill at Anaconda Aluminum Company, Louisville, Kentucky.

MORGAN CONSTRUCTION CO., WORCESTER, MASSACHUSETTS

ROLLING MILLS • MORGOIL BEARINGS • GAS PRODUCERS
WIRE MILLS • EJECTORS • REGENERATIVE FURNACE CONTROL

A boon to screw machine shops

ALUMINUM COLD PROCESSED ROD AND BAR

An entirely new production process is employed to yield a superior species of aluminum rod and bar stock made by Hunter Engineering Co. and sold exclusively by the Metals Division of Olin Mathieson Chemical Corp. Here's how the new rod is made.

by F. L. Church, Senior Editor

A POUND of aluminum bar stock will usually yield three times as many screw machine parts as a pound of brass or steel. The reasons are obvious enough: Aluminum weighs about one-third as much as the competitive metals; and its physical properties are adequate for most screw machine uses.

On the strength of this three-for-one factor, aluminum enjoys a comfortable cost advantage over copper-base alloys in most screw machine business. When steel is the competitive threat, aluminum's principal attributes are its light weight, corrosion resistance, excellent machinability, and the ease with which it takes a wide array of finishes.

Small wonder, then, that aluminum has won a firm foothold in the screw machine field, usually at the expense of other metals. And now a new and improved type of aluminum screw machine stock is strengthening this foothold by enhancing the metal's already formidable advantages.

The improved rod and bar stock is produced by an entirely new process developed by Hunter Engineering Co., Riverside, Calif. The process has been in operation at the Hunter plant well over a year — ample time for field reports to prove the superior qualities of the material.

Most aluminum screw machine stock in use today is produced by the traditional hot rolling and cold drawing method that evolved over the decades in the production of iron- or copper-base alloy rod and bar. The Hunter process, on the other hand, was developed with aluminum's metallurgical and physical characteristics in mind.

The outstanding innovation in this process is the direct reduction of a billet to a rod in one swift stroke of a specially designed extrusion press. Since this takes place at slightly above room temperature (far below the recrystallization temperature of aluminum) and since the reduction ratio may range from 8:1 up to 35:1, the metal is subjected to an enormous amount of cold work. To a screw machine shop, this means a very fine grain structure, resulting in exceptional machinability.

This reduction process is a logical outgrowth of the cold forging process which Joe Hunter, president of Hunter Engineering, developed several years ago.

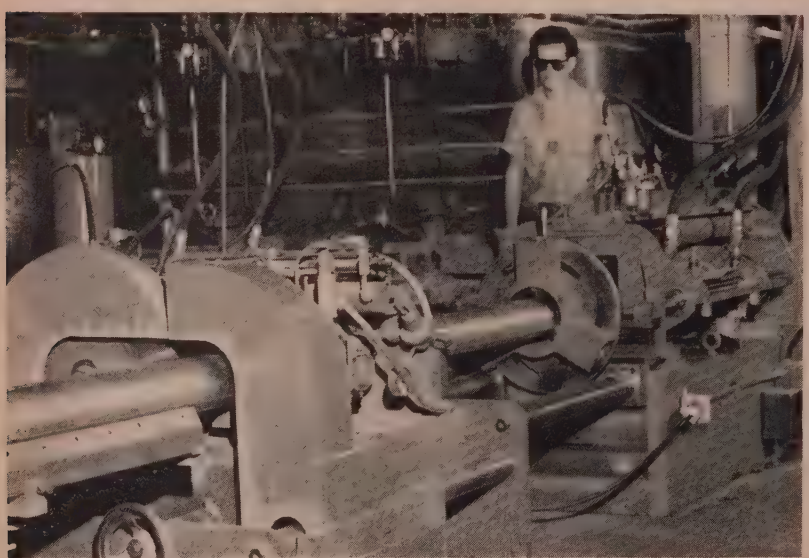
The excellent mechanical properties, surface finish, dimensional uniformity and production rates achieved with cold forging led Hunter to feel that adaptation of the cold forge principles would yield superior mill products such as rod, bar and tube.

But before his theory could become a production reality, Hunter had to come up with an entirely new method of producing aluminum extrusion billets. He had found that commercially available D. C. (direct chill) billets lacked the cleanliness, soundness, uniformity and fine grain needed for the cold reduction process.

The invention that was born of this necessity is a unique and remarkably compact continuous casting machine that produces uniform, high quality extrusion billets in a wide range of alloys, diameters and lengths. Though developed expressly for Hunter Engineering's cold processed rod production, the machine is also applicable to hot extrusion — particularly the small one-press shop that cannot justify the investment in a big D. C. billet casting operation.

As is the case with any aluminum mill product, the production of cold processed rod at Hunter Engineering begins with molten metal. Melting, alloying and refining are done in conventional manner in gas-fired furnaces. Final refining, analysis and temperature adjustment are accomplished in an adjacent holding furnace.

When metal is ready to be cast, it is



Hunter-developed continuous casting machine produces aluminum billets of the very high quality required by the cold processing method. In this view, continuously cast "log" is seen emerging from machine and passing through cutoff saw in foreground. Saw can be synchronized to casting cycle to cut billets to required lengths. For rod output, "log" is cut in long lengths, homogenized, then cut to billet lengths. Machine is suitable for hot extrusion operations.

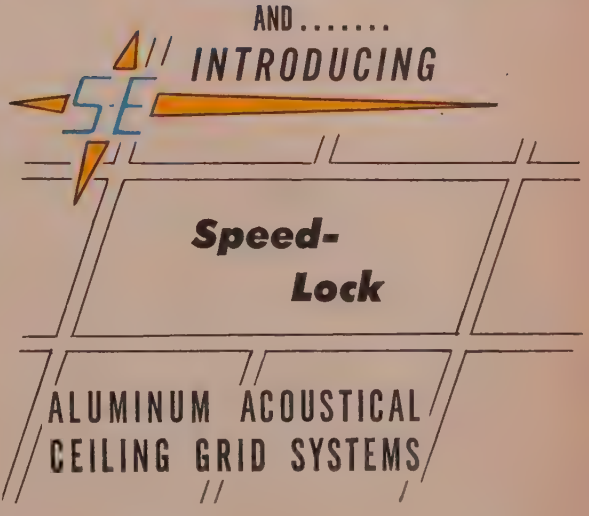
S·E

SOUTHERN EXTRUSIONS, INC.

ALUMINUM EXTRUSIONS IN COLOR

Here at Southern Extrusions you will find a complete service . . . from extrusion die design and tooling to ready-to-use color-anodized extrusions. Our quantometer laboratory controls every stage of production, thus assuring you of flawless extrusions and the most durable colors . . . with sealed-in-color!

In addition to our main extrusion plant, we now operate two anodizing plants, handling sheet sizes up to 6 ft. by 25 ft. We invite you to make Southern Extrusions your headquarters for both structural and architectural alumilited finishes. Large or small, your requirements receive complete and immediate attention.



WE CAN'T DO MORE... BUT WE DO IT BETTER!

SOUTHERN EXTRUSIONS, INC.

PHONE CEntral 4-4260, P.O. BOX 750X, MAGNOLIA 2, ARKANSAS

■ *After a 30-hour homogenization treatment, billets are cut to length, scalped, then cleaned, etched and coated with a special lubricant. In photo at left, operator is hanging scalped billets on conveyor that carries them through the cleaning, etching and lubricating line. Between etching and lubricating, billets are visually inspected for defects. Photo at right shows spinner head of Ransburg electrostatic spray unit that coats entire billet with lubricant.*

laundered into the Hunter continuous casting machine (see photo). This unit, together with furnace equipment, occupies about 20 by 50 feet of floor space, and is capable of producing billets ranging from 2 to 30 inches long and from 2 to 7 inches in diameter. It appears to be at its best when casting billets in the 3½ to 7-inch diameter range.

Heart of the machine is a movable water-cooled mold which slides horizontally on two machined steel tie rods. Power source is a compact Hydro-Check air-hydraulic system, and automatic control is provided by limit switches and standard industrial timers. Once put in operation, the machine runs itself.

Here's How It Works . . .

The actual mode of operation could be compared, roughly, with the filling stroke of a hypodermic needle. To get the cycle started, a dummy billet is needed to close off the open end of the mold. When the cycle is started, the mold begins to move slowly away from the feed nozzle. Molten metal, which is under a slight hydrostatic head, flows through the feed nozzle and into the mold cavity and begins to solidify immediately.

Metal continues to flow into the steadily lengthening mold activity until the mold reaches the predetermined end of the filling stroke. The mold stops, dwells long enough (6 to 40 seconds depending upon alloy and billet diameter) to insure nearly complete solidification of the billet.

The mold then quickly retreats to the start position and the cycle is repeated. This time, the just-cast billet closes off the open end of the mold cavity. The next billet is, in effect, welded to the first one as the stroke is repeated.

Reason for this is that a zone of semi-molten metal remains at the aft end of the previously cast billet. It later solidifies along with the molten metal that comprises the front end of the next billet. Thus, a continuous "log" of aluminum is cast, with evenly spaced "cut points" created by each stroke of the movable mold.

A hydraulically actuated circular saw cuts "logs" to suitable lengths for the subsequent homogenizing treatment. The blade of this saw was specially developed by Hunter to cut hot metal (the billet leaves the mold at a temperature of 800 to 1000°F, depending on alloy, billet size, etc.). Carbide inserts in the blade are spaced farther apart than normal to give greater clearance for chips. The saw chops through a 2½-inch billet in 2 seconds.

If the billets did not require homogenization — in a hot extruding operation, for example — the action of the saw could be synchronized with the casting cycle to cut billets to length as they are produced. In this case, the saw would be positioned so that the blade would enter at the point where two billets are joined, and its action would be timed to coincide with the solidification dwell period.

Casting rate of the Hunter machine varies from about 300 pounds an hour on the 2-inch billet to approximately 1600 pounds per hour on the 7-inch billet.

The principal objective, however, is quality, not speed. Success of the cold reduction process requires a billet of exceptionally high quality — fine, well equiaxed grain structure, free of porosity, inclusions, segregation, and the like. This process consistently produces the desired results, according to Dick Brill, executive vice president of the firm.

"We can take a billet at random from this machine, scalp it, slit it down the middle, polish and etch it, and then Dy-Chek it all over without showing a crack, a shrink, or any significant porosity," he points out. "Do that to your average D. C. billet and you'd think it had small pox."

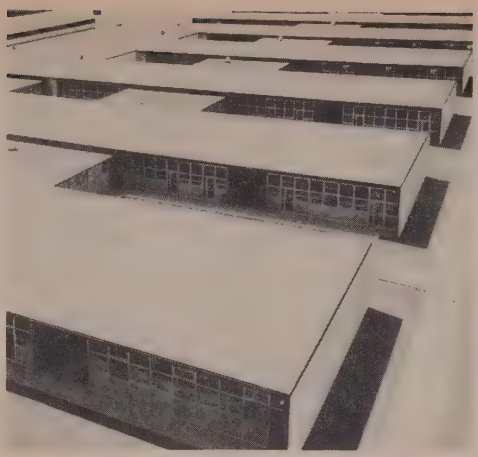
Better Billets Because . . .

Brill attributes the quality of the results to a number of factors. Since there is no movement of the mold relative to the billet during solidification, no stresses are imposed during the cooling period. What's more, cooling water never touches the metal. This avoids severe quenching of the metal, thus minimizing the danger of cracking due to the thermal stresses.

Metal quality is also influenced by billet size and rate of flow of molten metal into the mold. The Hunter machine casts a comparatively small cross section, thus reducing the likelihood of segregation. And since metal enters the mold at a relatively slow rate and with practically no turbulence, practically no oxides or dross get into the billet.

Dick Brill sees a sizable potential market for the billet caster among small independent extruders.

"We are presently using the process entirely for our own production," he notes, "but test runs have been made by a number of hot extruders and the results have been highly gratifying. Because of the consistency of billet quality, plus the slow cooling rate inherent in the process, it is believed that partial homogenization takes place. The hot extrusion people have indicated to us



Engineering laboratories at the new Convair (Astronautics) plant, San Diego. All exterior aluminum is protected against atmospheric staining and oxidation with a clear, colorless coating of Butyrate lacquer.

WEATHER-RESISTANT BUTYRATE LACQUERS PRESERVE THE NATURAL BEAUTY OF ALUMINUM

Factory-applied coatings of Butyrate lacquer provide long term protection for outdoor aluminum.

Clear and colorless, Butyrate lacquers won't yellow, even under prolonged exposure to sunlight. They withstand oxidation and discoloring...have high strength and flexibility...are little affected by salt spray or temperature change.

Aluminum surfaces, when protected with Butyrate lacquers, require little in the way of cleaning and maintenance. Usually, the action of rain alone will keep the finish clean and attractive.

This combination of features plus resistance to mortar and plaster staining makes Butyrate lacquer especially advantageous for use on outdoor architectural aluminum...siding, spandrels, curtain walls.

Butyrate lacquers are easy to apply by spray or dipping. A single coat provides excellent protection. They are available from lacquer manufacturers in all parts of the country.

An informative 15-minute, 16mm. sound color film has been produced especially for viewing by those who design in or specify aluminum for outdoor use. Would you like to see it? See below.

Butyrate lacquer, applied immediately after fabrication, protects the aluminum-framed sections, manufactured by Metalco, Inc. of Emeryville, California, from mortar staining and abrasion during erection and from weathering afterward.

The finest lacquers for aluminum are made with

Eastman BUTYRATE

ALUMINUM FABRICATORS!

Take these steps to get the complete story on preserving exterior aluminum surfaces.

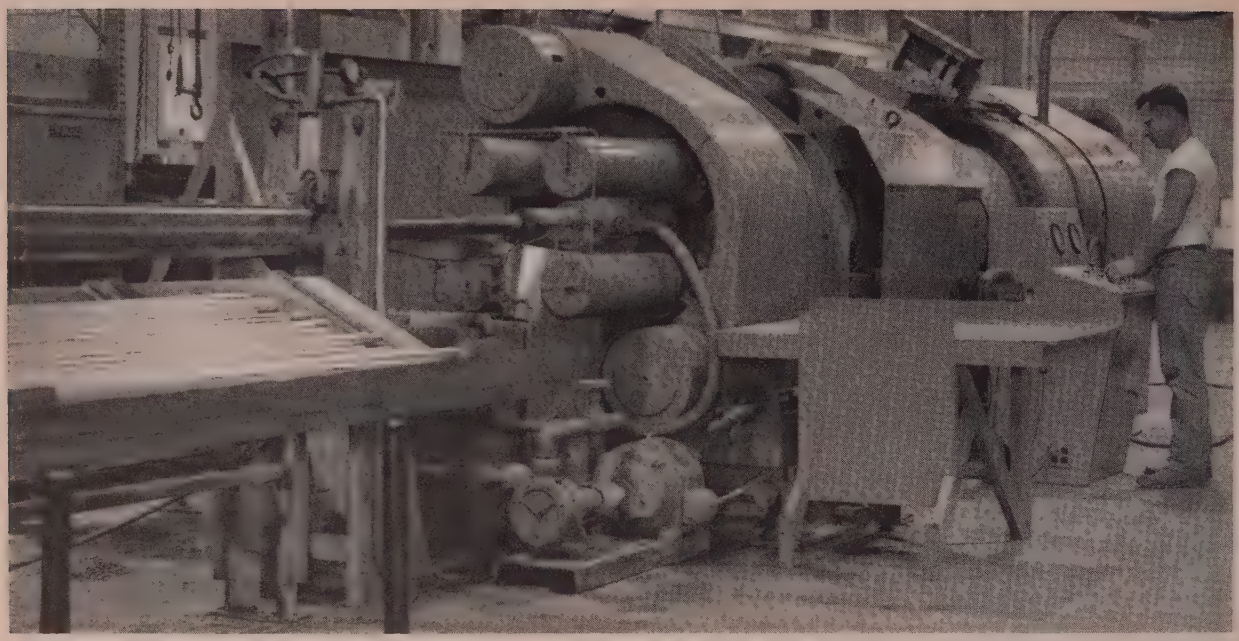
1. Send for Eastman's catalog on Butyrate lacquers for aluminum. It tells you how these lacquers are effectively preserving exterior aluminum surfaces in all parts of the country.

2. Check Sweet's Industrial Construction File, Sweet's Architectural File, or see 15-M of the A.I.A. Alphabetical Filing System for specification details.

3. Send for sound color film. Please indicate the date you plan to show the film and an alternate date.

4. Write for names of manufacturers of Butyrate lacquer in your area.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Mass.; Greensboro, N. C.; Houston; New York; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



■ ***One billet plus one push equals one gleaming rod of aluminum screw machine stock. This view shows the 1000-ton press, designed and built by Hunter Engineering, in action. The cold forming process (billet is merely warmed to condition the lubricant) requires exceptionally sturdy press that works to extremely tight tolerances. High pumping capacity gives fast cycling speed (up to six strokes a minute on the 450-ton press). High degree of cold work aids refining of grain structure of bar stock; hard alloys such as 7075 are formed as easily as 1100 alloy.***

that they can obtain higher production with our billets than with conventional D. C. billets."

Although the process produces a higher quality billet than is normally needed for hot extrusion, Brill believes the machine offers many advantages to the small extruder.

For Hot Extrusion, Too

"It's not economically sound to install a D. C. casting department for a small one-press setup. You have too much capital invested and too large a crew for the amount of billet you require. But with this machine you can get exceptionally high quality billet — in all extrusion alloys — with a low capital investment, low operating cost, and without hiring specially trained people.

"What's more, you can use your own shop generated scrap, plus whatever scrap you can buy on the market. Installation of the machine is very simple. Just set it down on the floor, make your air and water connections, plug it in, and start casting.

"Start-up generally takes about half an hour, while change of molds for different billet sizes takes about two to three hours. Wear of the polished steel mold liner is practically nil because the metal shrinks away from the mold when it solidifies."

Getting back to the rod and bar operation at Hunter Engineering, billets are homogenized, scalped and lubricated before extrusion. A 30-hour homogenizing treatment is specified for all alloys except 1100. Billets are then cut to length and scalped on specially designed lathes that handle 2 to 5 billets per minute. Metal removal varies from 1/16 to 3/16-inch depending on billet size.

Scalping is necessary to remove any surface imperfections such as oxides and cold shuts. It also gives precise control of billet diameter.

Scalped billets are then loaded on a chain conveyor that carries them through a multi-stage cleaning, etching and lubricating operation. Operations here include alkaline cleaning, caustic etching, desmutting, and several water rinses. Cleaned and etched billets are visually inspected for defects as the conveyor carries them to the lubricating booth.

A special lubricant developed by Hunter Engineering is applied by a Ransburg airless electrostatic spray unit.

Billets are now ready to be cold processed. Hunter Engineering presently has five presses with power ratings of 450, 750, 1000, 1600, and 2500 tons. The 1600-tonner is usesd primarily for producing aluminum irrigation pipe. All but the 2500-tonner were designed and built by Hunter Engineering.

"There's quite a difference between these babies and your normal hot extrusion press," explains Jack Doan, extrusion operations manager. "The pressure on the ram is up to 5 times that of a hot press of equal rating, and extrusion pressures run as high as 250,000 psi.

"And even at these pressures, we often have to move the ram into the chamber with a total clearance of a few thousandths of an inch—without binding or galling. So press alignment is much more critical. The machine has to be more rugged and at the same time more precise than normal.

"There are other differences," Doan continues. "Pumping capacity, for example, is very high so that we can cycle rapidly — from 2 times a minute on the biggest press to 6 strokes a minute on that automated 450-tonner."

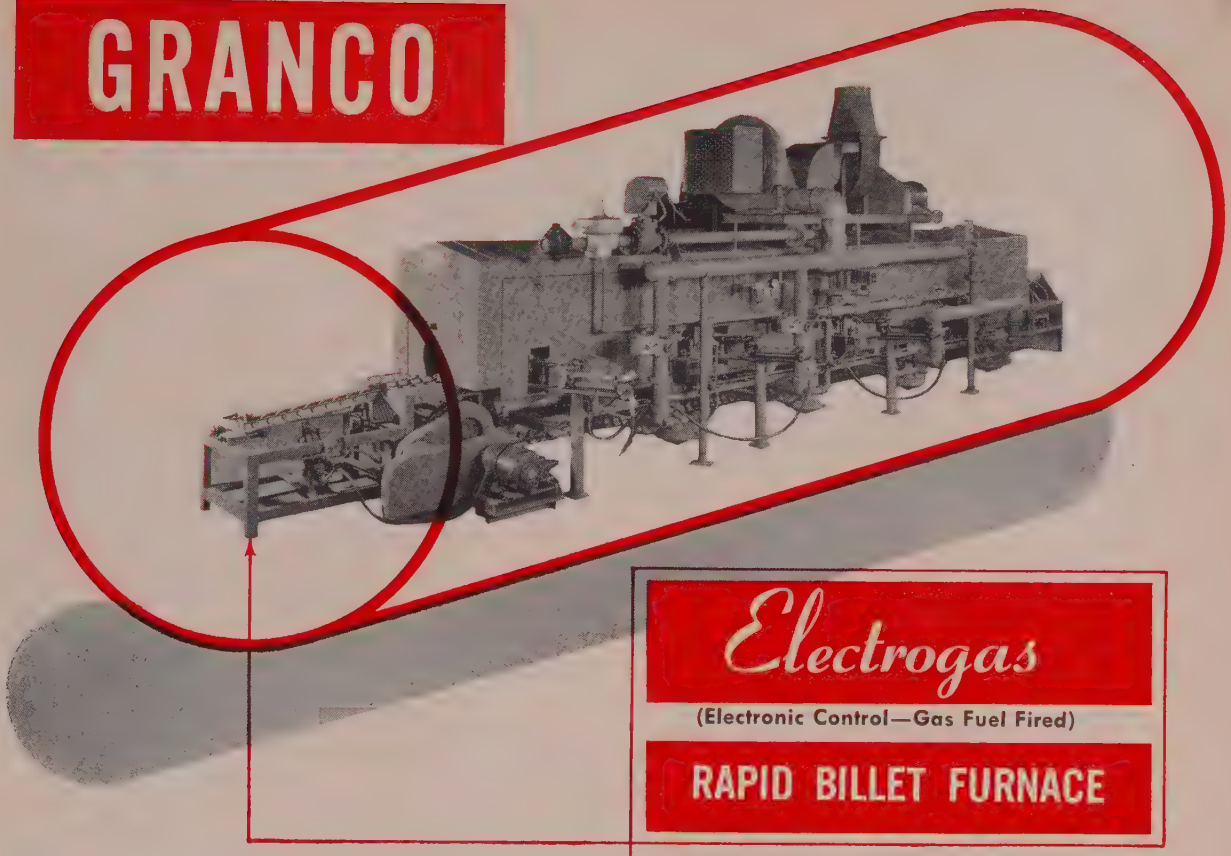
Six Strokes a Minute

The actual reduction of a billet to a bar is remarkably fast for an extrusion operation. The completely automated 450-ton press is operated by one man, and all he does is load billets into the Magnethermic heater magazine. The automatic cycle takes over from there.

The heater warms billets to 100-200°F (purpose is to condition the lubricant, not heat the metal) and feeds them to the extrusion chamber of the press at a rate of 6 per minute. This press has a ram speed of over 200 inches per min. With each stroke of the ram a gleaming bar of aluminum shoots out of the press onto an inclined runout table, and drops from there into an accumulator. As the accumulator fills up, the operator bundles the bars together and a fork lift truck carries them away for subsequent processing.

There is no butt end; the entire billet is extruded into a bar, which is forced from the die by the following stroke of

GRANCO



Electrogas

(Electronic Control—Gas Fuel Fired)

RAPID BILLET FURNACE

Electrogas is the 1960 model of the famous Granco Contact Rapid Billet Heater. Incorporating the most modern and reliable electronic control system available, it is the only completely automatic billet furnace.

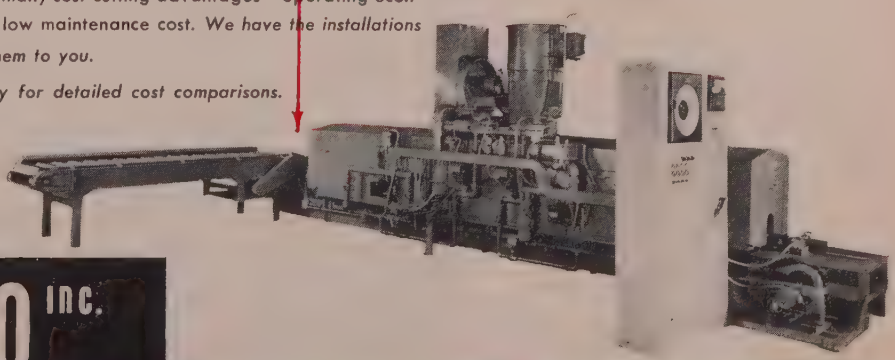
Electrogas is easily adapted to any style or make of extrusion press; can be fired with any type of gas at far less operating cost than other heating media; does not require expensive water installations.

Electrogas produces more uniform heating of billets at any conventional extrusion temperature, and/or any billet size within the size range of the model—without time-consuming changing of coils.

Electrogas is being used in the extrusion plants of almost all of the primary aluminum producers; is the ideal replacement for old-fashioned soak type furnaces in smaller extrusion plants.

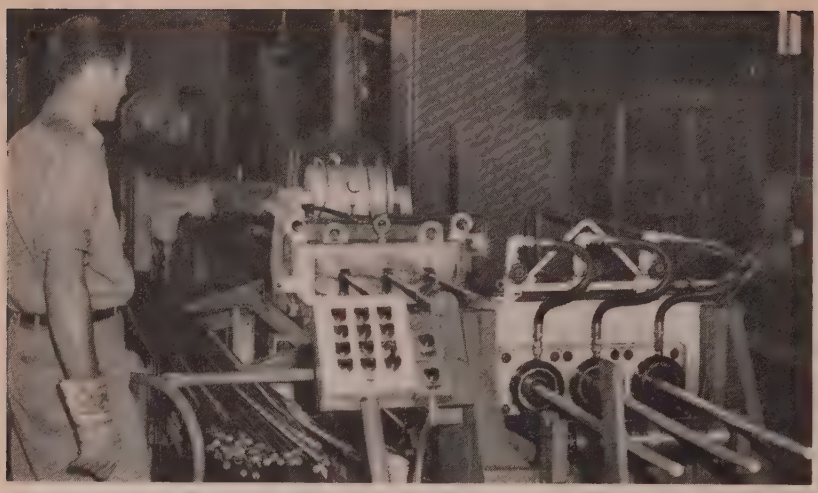
Electrogas offers you many cost-cutting advantages—operating economy, low installation cost, low maintenance cost. *We have the installations to prove it—let us show them to you.*

Write today for detailed cost comparisons.



GRANCO INC.

317 Thirty-second Street, S.W. • Grand Rapids 8, Michigan • Telephone CHerry 5-0591



■ *Cold reduction of three rods at a time on a multiple drawbench. This action imparts T3 and T8 tempers to alloy 2011.*

the ram. Extrusion speed is not affected by alloy. In fact, alloy 7075 can be extruded as fast as alloy 1100. In either case, plastic deformation of the metal is very uniform along the length of the bar and from surface to center.

Degree of reduction varies from 8:1 to 35:1 depending on diameter of rod produced. This variable also influences the production rate, which may range all the way from 1000 to 10,000 pounds per hour.

The grain structure of cold processed rod is very fine, due to the high degree of cold work plus the relatively fine grain of the billets used. There are no inclusions, coring, seams, laps or cold shuts. Surface of the bar is very clean and glossy due to the use of polished carbide dies, plus the fact that billets are scalped prior to extrusion.

Alloys; Tempers; Sizes

Cold reduction is followed by conventional finishing operations. Depending upon alloy and temper desired, cold processed rod may be solution heat treated and quenched. In the case of alloy 2011, tempers T3 and T8 are achieved by cold drawing three rods at a time.

Round rods are straightened in a skewed roller straightener (hexagonals in an in-line roller straightener) cut to length, chamfered, continuously marked, color coded, and packaged in a unique "stak-pak" system that facilitates shipping, storage and dispensing of rod and bar stock.

All commercial aluminum alloys can be processed by this method, but most of Hunter Engineering's production is 2011-T3 and T8, 2014-T4 and T451, 2017-T4 and T451, 2024-T4 and T351, 6061-0, 6061-T4, 6061-T6 and T651, and 7075-T6 and T651. Sizes range from ⅜-inch to 2½-inches on rounds and hexagonals. Bulk of the output is shipped in standard 12-foot lengths, though special lengths can be supplied.

Olin Sells It All

Hunter's entire production of cold processed rod and bar — currently approximately one-half million pounds per month — is sold through Olin Aluminum, Metals Division, Olin Mathieson Chemical Corp. Hunter delivers the material to Olin in Stak-Paks (standard mill packs) which can be used in conjunction with a special rod dispensing rack to simplify single rod dispensing.

The Stak-Pak may be stacked to 8000 pounds (eight 1000-pound Paks or four 2000-pound Paks), eliminating storage racks for back-up stocks. With racks spaced 8 inches apart, 40,000 pounds of aluminum rod may be stored in 114 square feet of floor space. It is not necessary to open bundles and place rods individually in racks. Clearance under the pack prevents corrosion by floor moisture and permits easy engagement of crane sling or fork lift.

The cold extrusion process is eminently suited to the production of other types of aluminum products — notably tubular shapes. In fact, the 1600-ton press is presently turning out substantial quantities of heavy-end irrigation pipe. This was the first cold processed aluminum product to reach commercial production at the plant.

The principal advantages of the process for this type of product include high production rates, the absolute watertight integrity of the product (it doesn't even have to be inspected), and the characteristic high strength cold worked metal structure achieved with one swift stroke of the press.

Billets that are destined for pipe production are prepared in roughly the same manner as rod billets, except that they are drilled down the center to make way for the extrusion mandrel. This mandrel, incidentally, is tapered so that the wall thickness at one end of each pipe is heavier, hence more resistant to damage during coupling.

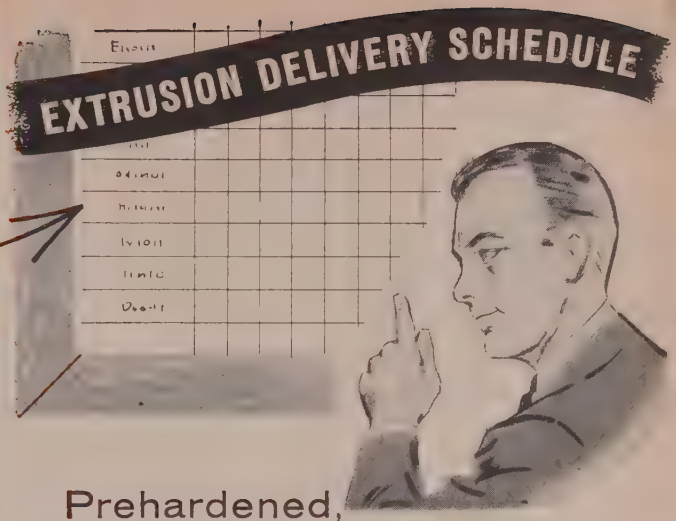
The other end does not have to be heavier because a patented coupling is permanently attached to it. Hunter does not supply the couplings; the company only sells the pipe to other firms that supply complete irrigation systems.

Encouraged by the commercial and technological success of the rod and pipe programs, Hunter Engineering's management men see promising possibilities for the cold forming process in other product lines. As Dick Brill puts it:

"We now think we can compete costwise with galvanized steel in almost any tubular product, whether it be a common fence post, a cross arm for a power line pole, or electrical conduit. When you add aluminum's natural advantages of light weight, corrosion resistance, good looks and high scrap value, the possibilities for this process look downright exciting."

■ *View of special Stak-Pak storage of cold processed screw machine rod. Used in conjunction with a simple dispensing rack, the system minimizes rod handling.*

VISCOUNT 44
pays off here!



Prehardened, machinable H-13 Hot Work Steel saves heat treat time on extrusion tooling!

Extrusions shipped up to 48 hours faster? Certainly! . . . when you eliminate heat treat time on extrusion dies, backers and bolsters. Not only do you gain time but you are certain of "clean" metal at bearing surfaces . . . metal free of surface decarburization sometimes resulting when finished tooling is heat treated.

Practical to machine? Certainly! . . . even though Viscount 44 is furnished prehardened at Rockwell C44-46, it is readily machinable.

Other extrusion die steels made by LATROBE

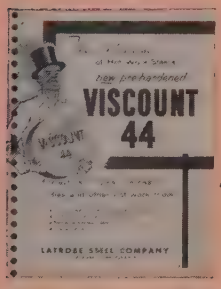
Metalmasters

to exacting standards . . .

LPD Type H-12

VDC Type H-13

VISCOUNT 20
Free machining Type H-13



A wide range of Viscount 44 sizes is available near you. Call Latrobe today! . . . or send for this bulletin!

LATROBE STEEL COMPANY
LATROBE, PENNSYLVANIA

MEMBER OF AEC ALUMINUM EXTRUDERS COUNCIL

BRANCH OFFICES and WAREHOUSES: BOSTON • BUFFALO • CHICAGO • CLEVELAND • DAYTON DETROIT • GRAND RAPIDS • HARTFORD • LOS ANGELES MIAMI • MILWAUKEE • NEW YORK • PHILADELPHIA PITTSBURGH • TOLEDO • SAN LEANDRO • YOUNGSTOWN

Riveted Aluminum Bridges

Drawing shows how new Long Island Expressway bridges will look to oncoming drivers. Each, including abutments, wingwalls and deck, cost about $350,000. Similar steel bridges would cost 18% less, but low maintenance costs of aluminum will partially offset this difference in a few years say bridge designers Andrews & Clark.

BEFORE the warm rays of the sun beat down upon next summer's stream of home-bound workers, two riveted aluminum bridges will be carrying the traffic of the Long Island Expressway over the east and west sections of the Jericho Turnpike in Nassau County, New York.

The spans have been completed, and are being used by bull dozers and other construction equipment rushing about trying to finish the highway itself. When this is done, sometime before summer, the bridges will be cleared of a protective two-foot earth coating, strung with aluminum guard rails, dedicated, and opened to the public.

General contractor for the $4,384,623 job is Hendrickson Bros. Inc., New York, who contracted Pullman-Standard of Chicago to fabricate components for the structures. Andrews and Clark, also of New York, designed the bridges and drew up specifications, while E. G. McDonnell Rigging Co. did the erection.

Aluminum alloy 6061-T6, with a high magnesium and silicon content, was used for all bridge components, including rivets. In final erection, girders were joined to diaphragms with aluminum plated bolts. Plate and extrusions used were supplied by Alcoa, Kaiser and Reynolds.

The two bridges are almost exactly the same size. Each is 76 feet long; the east span is 135 feet wide, the west 128. Both have a clear span of 76 feet 9-3/16 inches, and a clearance of 14 feet 9 inches. Aluminum used totals 142,284 pounds for the 18 girders of the east lane, and 133,948 for the 17 girders of the west bound structure. Designers say these bridges weigh 14 pounds per square foot, and estimate that similar steel structures would weigh 35 pounds per square foot.

Actually, the design differs little from that of conventional steel construction. The main difference, according to Robert Kavlock, industrial engineer at the Pullman-Standard plant, is that more welding would have been used on a steel bridge.

It seems riveted bridge girders are a novelty these days, but George W. Zalite, of Andrews and Clark, backs up his firm's choice of such fabrication. "The design for these two aluminum bridges was started approximately three years ago," Zalite points out. "Riveted construction was chosen then as a more conservative approach for these pioneer structures, and we believed greater competition in fabrication would be available as compared with welding."

Andrews and Clark says that aluminum was chosen for the two bridges because the "alloy's light weight and corrosion resistance provided distinct advantages." These advantages helped simplify shipping, erection and finishing operations, thus cutting total costs.

Prefabricated Girders

The girders were prefabricated at Pullman-Standard. Sections of the bridge were erected at the plant so that placement and other facets of the final erection could be checked. This done, the bridges were dismantled and the girders were shipped by rail to Long Island. As many as seven girders were stacked on one open-end gondola car for shipment. Though such transportation could be provided for steel beams, many more cars would have to be used since only one steel beam could be carried by each car.

Because of the light weight of the girders, lighter, more easily manipulated rigging equipment was used. This cut erection costs and speeded the operation. It took only four days for the 35 girders of the two spans to be swung into place and secured.

Protective costs were minimized since most of the aluminum superstructure was left unpainted. Only the surfaces of the top girder flanges, on which the concrete slab was laid, were painted.

Zinc chromate was used to minimize the mild etching effect wet cement has on aluminum.

In planning the bridges, each girder was designed to do a specific job. In shop fabrication special precautions had to be taken so that each girder was properly positioned. Not only was each girder marked for placement, but its camber was also recorded so that in final riveting, the precise beam shape needed would be retained. All but three of the girders are 48 inches high. The special ones are 56 inches high and are placed at points where the greatest loads will be encountered.

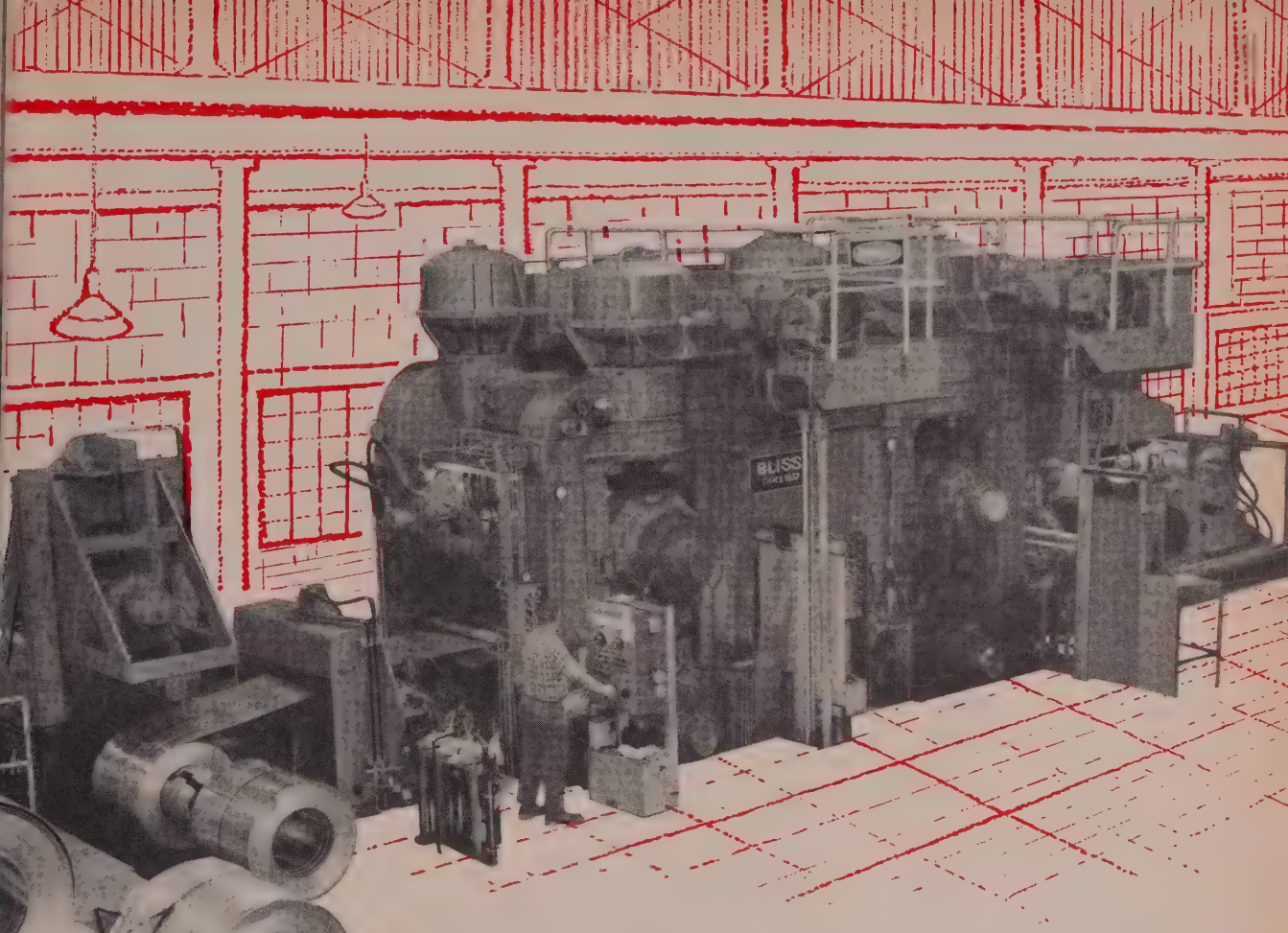
Girder construction followed a simple but careful pattern so that exact camber was produced and retained. Three 26-foot sections of ⅜-inch plate were spliced with ⅝-inch plates to make the 78-foot webs. Next, the complete girder was assembled on a jig, holes drilled and top and bottom flanges and stiffeners bolted in place.

The entire girder was then moved from the jig to a riveting station. Here, a gigantic gun running on tracks moved up and down the unit replacing bolts with ¾-inch rivets. The rivets were cold-driven using a Chicago Pneumatic gun and hydraulic equipment designed by Pullman-Standard. Approximately 1600 rivets were used per girder—more than 5600 for the entire job.

To protect camber the following steps were used: First, top angles were joined to the web, then bottom angles. These formed top and bottom flanges of the I-beam. Then, splice plates, one on each side of the seam, were riveted, and finally stiffeners were done.

Flanges are composed of two extruded aluminum angles riveted to the web. The vertical leg of the top angle is four inches long and ⅝-inch thick, the bottom leg is 7 inches long and ¾-inch thick. Angles composing the bottom flanges have 7-inch vertical legs of ⅝-inch thickness, and 8-inch bottom legs that are 1½ inches thick.

Two types of extruded stiffeners were used on each girder, eight T's and 34 angles. The ½-inch thick T-stiffeners



New Bliss mill doubles Quaker State Metals' cold rolling capacity

With a rolling capacity now approaching 10 million pounds a month, Quaker State Metals Company of Lancaster, Pa., division of Howe Sound Co., ranks as one of the largest independent rollers of aluminum in the United States.

A new Bliss tandem mill is a key unit in Quaker State's recently completed expansion program. In production a week after its erection was completed, the mill has more than doubled the plant's cold rolling capacity.

It reduces strip from .250 inch to .062 inch in a single pass. Delivery speed is 1500 fpm. Coil handling is completely mechanized, utilizing a coil opener equipped with a peeler knife and an automatic guide control.

Whether your own plans call for the addition or modernization of a single unit or a complete rolling plant, you'll find that the Bliss Rolling Mill Division can help you with the problems you may encounter. For examples of Bliss installations for rolling both ferrous and non-ferrous materials, write for our 84-page Bulletin 40-B.

BLISS
SINCE 1857

Bliss is more than a name . . . it's a guarantee

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

■ *Workmen are using gigantic squeeze riveter to join girder bottom flanges to web. Gun is so large that two men are needed to work it. At left, worker stands on girder to manipulate machine and make rivet, while at right another operator is below the girder helping to make the same rivet by handling bottom half of the machine.*

were placed at points where diaphragms were bolted to girders. Angles of ⅜-inch thickness give support at other points along both sides of the beam.

Alcoa, Reynolds and Kaiser supplied the girder components. Alcoa provided web plates and extruded angles for the top flanges, Kaiser extruded the bottom angles, and Reynolds extruded the T and angle stiffeners.

To finish off the girders 62 galvanized steel shear lugs were riveted along the tops, accounting for an additional 22,944 pounds on the west bridge, and 24,293 on the east. The shear lugs coordinate the concrete slab and the girders so they can work together to carry the traffic load.

Diaphragms used to connect the girders were made of ⅜-inch angles and plate. Six such cross-braces were used to connect each pair of girders. The four used in the center of the beams fit at right angles to the webs, but the two end diaphragms fit on a diagonal since the bridges themselves were constructed on a 30° skew.

Set Beams in Two Days

After girders for the westbound section were completed, bridge sections were assembled in the Pullman-Standard shop. The fit-up was necessary so that bolt holes could be reamed, and camber and position of girders could be checked so field erection would be quick and smooth. When fit-up was complete, the bridge was dis-assembled and shipped to Long Island. Girders for the east section were given the same treatment, and finally shipped to Long Island.

When the beams and diaphragms arrived at their destination, wingwalls and concrete pier abutments were already in place. The rigging crew set to work and in less than two days all the beams of the west span were positioned at 7-foot centers, and anchored. According to a Hendrickson Bros. spokesman, "The beams were set to perfection and there was no need for reaming drill holes." There was no riveting in the field, as aluminum-plated bolts were used to join diaphragms and girders.

No Expansion Troubles

Aluminum's elastic modulus and thermal expansion caused no problems in girder construction because riveting was used. However, according to Kavlock, the bridges are expected to expand or contract as much as 2½ inches with changing temperatures. To prevent buckling when this happens, only one end of the girders was anchored, the other end rests on bearings which will roll as the girders grow or shrink. Provisions were also made for the concrete which reacts similarly to temperature extremes.

Next, a 7-inch concrete slab was poured, with the steel shear lugs interweaving themselves with the mixture. On top of this, 2½ inches of asphalt concrete was laid for the road surface. Finally a two-foot blanket of dirt was spread to protect the road surface from the treads of road construction equipment, which were to be the bridges' first customers.

Except for a 7-foot parking strip on the east span, other dimensions of the bridges' roadways are the same. Each contains a 37-foot strip of pavement, a 12-foot mall through which public utility lines and pipes will be run, a 49-foot pavement, a 4-foot sidewalk and a 10-foot shoulder.

The practical advantages of aluminum were enough for the designers to choose it for bridge construction, but there were other reasons, too. As George Zalite says: "Aluminum has an inherent aesthetic appeal and we believe the two Long Island Expressway bridges will reflect this . . . The aluminum girders and the gray, brick-faced wingwalls will provide an attractive structure in harmony with the surrounding area."

Industrial engineer Kavlock pointed out many of what he considers unusual aspects of the two structures. He says they are "unique in size and magnitude" for aluminum usage, in addition to being two of America's few riveted aluminum spans. The smoothness of field erection was also unusual, he said, this usually being a bottleneck.

See Other Structural Uses

Kavlock feels these structures will pave the way for more uses of aluminum in construction since they are further proof that such large aluminum structures can be riveted. But Kavlock feels that aluminum's bridge future will show a definite trend toward welded fabrication, and away from riveting. He thinks riveted aluminum construction will be used in canal locks, power dams, and other such massive jobs.

Kavlock's opinion on such topics is an educated and experienced one. In addition to this job, he acted as welding engineer on the first welded aluminum bridge which was prefabricated by Pullman-Standard for the State of Iowa. That span near DesMoines has been in use almost two years.

James Rosser, vice president of sales for Pullman, says that both projects were "very satisfactory work" and that Pullman was hoping for more.

Say when--

And you'll get delivery on *anything* you need in

STAINLESS STEEL

- ✔ *Sheets*
- ✔ *Plates*
- ✔ *Strip*
- ✔ *Rounds*
- ✔ *Squares*
- ✔ *Hexagons*
- ✔ *Flats*
- ✔ *Angles*
- ✔ *Forging Billets*

REGARDLESS of what your stainless steel requirements may be--you can order *anything* ...and...*everything* you need from Castle.

Not only that but you can also say when you want delivery--and you'll get it, on time, every time, regardless of what you order.

Obviously, to give such quick, dependable service consistently, requires--a large and diversified inventory of stainless steel...complete shearing, sawing, and flame cutting facilities...plus...a full staff of experienced personnel on the job around the clock. Castle has all three of these requirements.

Since 1890, Castle has made it a practice to give every customer--fast, friendly, intelligent service on every order.

That's the kind of service you'll get when you order stainless--or anything else in steel or aluminum--from Castle.

And remember, when you order from Castle, you not only can *say when* you want delivery--but more important, you'll get it. So, why not call Castle today.

EVERYTHING IN STEEL AND ALUMINUM — CASTLE — STEEL DISTRIBUTORS -- SINCE 1890 — from coast to coast

Order from CASTLE--the full line distributor who can supply you with EVERYTHING in steel and aluminum

A. M. CASTLE & Co.

STEEL DISTRIBUTORS **-- Since 1890**

BALTIMORE • CLEVELAND • CHICAGO • MILWAUKEE • ROCKFORD • KANSAS CITY • LOS ANGELES • SAN FRANCISCO • BERKELEY • SEATTLE

WELDING THE LINCOLN GRILLE

Ford's Lincoln Division saw it this way: Aluminum for durability; extrusions for design latitude; welding for fast multiple joining. Here's how Kawneer did it.

by W. O. Shropshire, Process Engineer, Kawneer Co., Appliance Products Div., Cynthiana, Ky.

WITH the increase in the consumption of aluminum by the automotive industry, and as many auto applications for the metal are being sought, one of the first and most obvious places to look is in the decorative field. When thinking along these lines, one immediately considers the automobile grille.

Aluminum is especially well suited for this part for several reasons. First, it possesses all of the basic properties that a grille should have; second, it is light; and third, it can be extruded in an unlimited variety of shapes.

With strength and variety in mind, one would think first of an aluminum extrusion. The original approach was to blank out the major part of the extrusion because the primary function of the grille is air passage. But a tremendous amount of waste metal results.

The alternative approach would be to assemble individual parts. But this presents another group of problems:

1. They must be fastened together.
2. The assembly must be rigid.
3. It must withstand vibration.
4. The entire assembly, as well as the joints, must be capable of withstanding severe exposure.

Welding would seem to be the most obvious way to meet these requirements. But here again, certain problems are encountered. We find that we must:

1. Weld small areas and small cross-sectional areas.
2. Weld a large number of spots per assembly.
3. Weld in recessed or hidden areas as this is a decorative part.

These are not insurmountable by any means, as is evidenced by the 1960 Lincoln grille. First of all, the fact that it is to be welded must be kept in mind when the part first begins to take shape on the drawing board. The shape of the extrusions must be carefully considered from the standpoint of function, strength, spacing, and location of welds. This is not difficult if approached in the early stages of the design.

Success Depends Upon . . .

The fact that we must make a large number of welds is not a serious problem if we do several things. Individual parts must be jigged securely. This minimizes warping due to heat build-up resulting from a large number of welds.

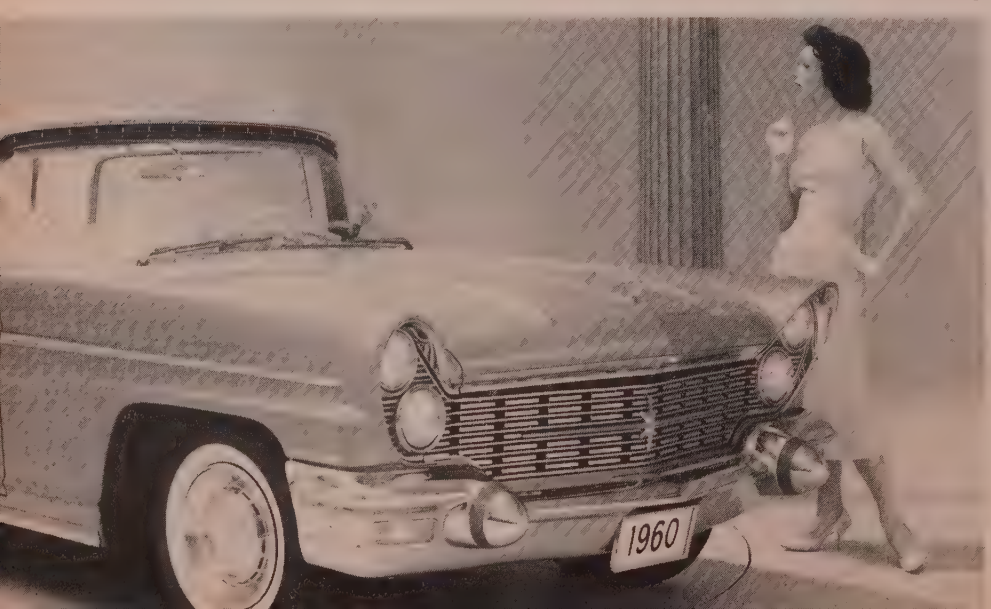
The part must then be indexed through the machine mechanically and automatically. This eliminates human error in placing the welds. Use of a multiple head machine also helps minimize this problem. The number of heads that can be used need be limited only by the available power or the limit to which one is willing to go as far as control circuits are concerned.

Since this is a decorative part, welds must not be exposed. As pointed out before, this can be accomplished by welding only in recessed or hidden areas. But the weld area must be designed to accommodate a tip that will carry sufficient current to make a good weld.

The 1960 Lincoln grille, which was born as a result of thinking along these lines, has an over-all length of 60 inches, a height of 12 inches. Its total weight is 5 pounds, 8 ounces, including 5 ounces of mounting brackets. It is made up of 58 parts consisting of 28 extrusions (20 verticals and 8 horizontals), 10 mounting brackets, and 20 mounting bracket rivets.

It has a total of 154 welds, 146 of which are spot welds and 8 of which are heliwelds. (The latter could have been eliminated with more early thinking.) Actual welding time is one minute and 15 seconds. Due to the size of the part, however, the index time limits the production rate to one grille every two minutes, 40 seconds.

Welds are periodically checked during various stages of production, and at different points throughout the grille. Individual welds are ground through the center section, and photomicrographs taken. They consistently show a sound metallurgical bond with a minimum of porosity. These photographs also give a good indication of the



■ ***Aluminum's weldability, its light weight, corrosion resistance and its ability to be extruded in an unlimited variety of shapes make it especially well suited for auto grilles. The Lincoln grille shown here weighs little more than five pounds.***

NORTHWEST

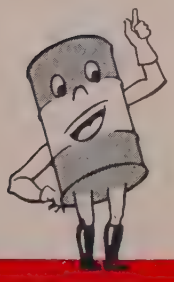
LEADS THE WAY WITH CHEMICALS FOR USE WITH

ALUMINUM

If you work with aluminum you'll be interested in Northwest's outstanding line of chemicals for use with modern alloys. Northwest's continuing research and development program has earned them the reputation of "First with the best" in this rapidly developing field. It will pay you to investigate:

REMEMBER!

"Your cost per finished article is the true cost of your cleaner."

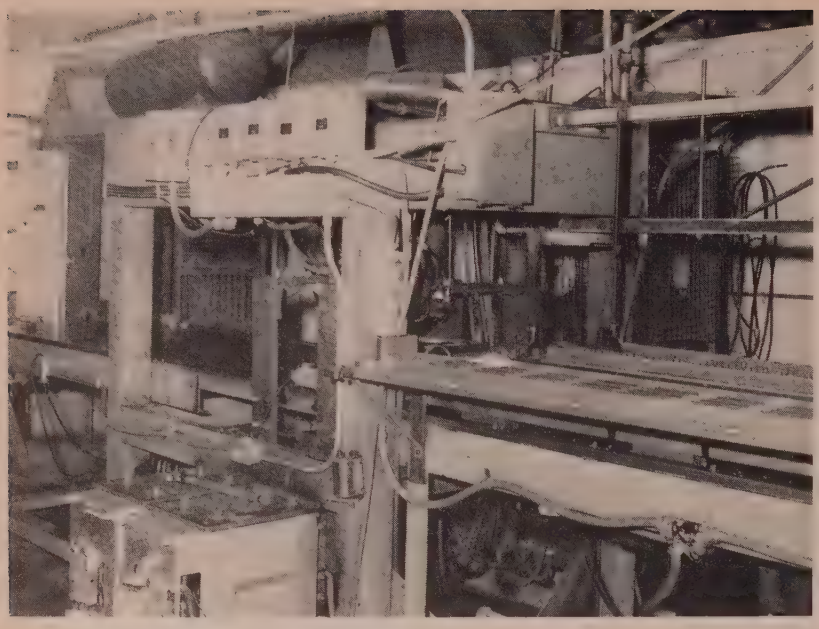


- **ALKALUME L.C. #1**— A neutral cleaner, outstanding for removal of buffing soil.
- **ALKALUME AC #1** — Acid cleaner for all types of soil.
- **ALKALUME ASE #1** — A single stage acid cleaner for all types of soil.
- **ALKALUME #13**— A non-etching, non-silicated alkaline cleaner.
- **ALKALUME "E"**— An exceptionally long-lived etchant.
- **ALKALUME DS**— Smut removing cleaner.
- **ALKALUME Preplate**— An especially effective zincate bath.
- Drawing & Stamping Compounds for Aluminum.

Licensed Manufacturers: Alert Supply Co., Los Angeles, California
Armalite Company, Ltd., Toronto, Canada

NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.



■ *Twenty-eight aluminum extrusions making up the Lincoln grille are jigged securely and indexed through this multiple head welding machine mechanically and automatically. A total of 154 welds are made — 146 spot welds, 8 heliwelds.*

also give a good indication of the weld structure and the heat affected zones.

Tensile tests are also periodically made. They show an average of 460 pounds, with separation usually occurring within the part rather than at the mating surface.

As was recommended earlier, this process is completely automatic except for locating the individual parts in the welding jig. The jig is then lowered to the carriage which indexes through, making 40 individual moves (usually 4 welds per move), then returns to its original position. At this point the jig is raised from the carriage, and the part is ejected. During this process, the second jig has been loaded and is ready for its cycle.

This process is accomplished by a feed mechanism controlled by a bank of Pulsa-Pak relays. These relays are actuated by micro-switches mounted either on the carriage or the frame of the machine, depending on their function. Air is used throughout with hydro-checks active in the welding direction. Electric motors and clutches could be used with equal satisfaction.

It should be pointed out that a properly designed welder can be quite flexible. The one under discussion (see photo) has adjustable stops in four directions (i.e. left to right and front to back). Since there is no limit to the number of moves that can be made, there is no limit to the number of welds that can be made.

One can also automatically vary the welding current (heat) from one point to another within the part to compensate for any necessary variation in the area of the mating surface or thickness.

Each welding circuit has it own individual primary and secondary which means, of course, that it has its own transformer. The entire circuit is water cooled with the exception of the bus-bar in the secondary which is air cooled.

Individual welding tips are mounted on double cylinder air guns, each having its own pressure regulator and flow rate control. A double cylinder gun is used since it produces maximum pressure with a minimum diameter. The small diameter allows the tips to be located closer together. This means closer welds, more welds per part and greater flexibility.

The process under discussion is not only interesting, but also challenging. This stems from the fact that it is completely flexible, and lends itself to an unlimited number and variety of parts. Here again, it should be pointed out that this is particularly true if the previously mentioned precautions are considered in the early design stages.

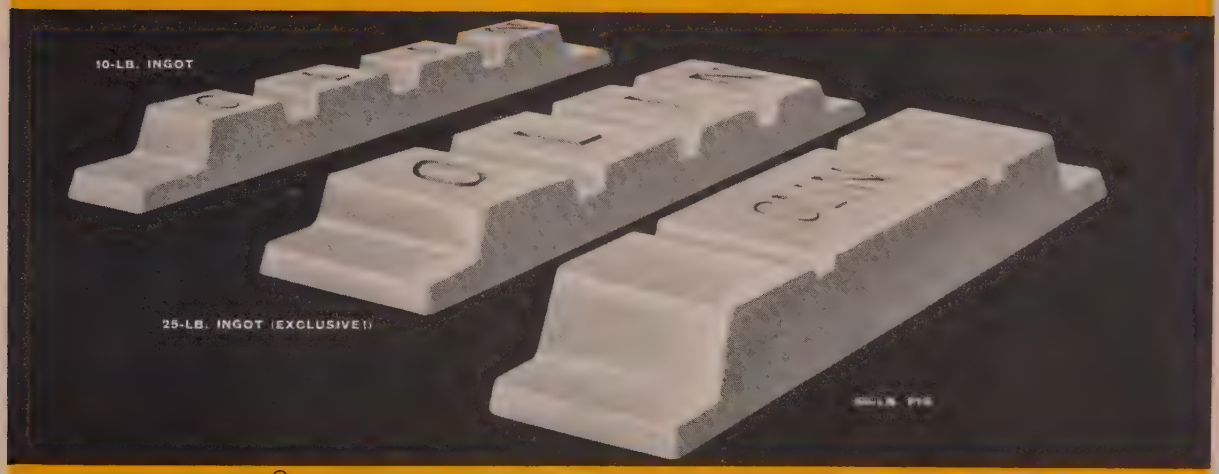
The basic design of the welder now in operation has proven satisfactory. Refinements are in order — as is always the case — if better processes are to be developed and better parts are to be produced. The machine itself can be made larger or smaller in any direction. This includes not only physical dimensions, but welding capacity as well.

Regarding the development of new processes and better parts, the fact that the development of this program was a joint operation with the full cooperation of Alcoa should be pointed out. The assistance of the entire personnel of their Process and Development Laboratory made the program possible.

The potentialities of this process and of similar operations in the aluminum industry are unlimited, provided early and detailed thinking is made a part of the program under consideration.

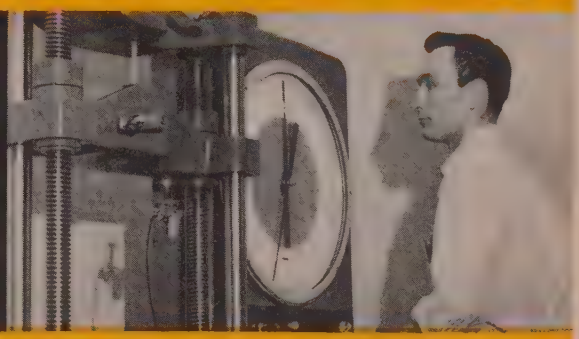
■ *The welding machine controls operate at 440 volt from a single phase, 14.7 KW line. Each welding circuit has its own 150 KVA transformer which is controlled by the panels shown and operates into a 150 micro-ohm secondary.*

HOW OLIN ALUMINUM HELPS YOU BREAK INTO NEW CASTING MARKETS



MORE EFFICIENT FORMS. Olin pig and ingot come in standard alloys, in 10, 25 and 50 lb. sizes. The 10 and 25 pounders feature smaller size to increase handling efficiency and speed melting, deep notches for easier breaking, 4-section design for faster crucible charging.

KNOWN CHEMICAL PROPERTIES. Every melt of Olin Aluminum undergoes exacting metallurgical and foundry controls. For example, using quantometric analysis, skilled metallurgists analyze samples of Olin Aluminum for all critical elements . . . and record the results electronically.



PREDICTABLE MECHANICAL PROPERTIES. Batteries of testing devices like this tensile machine are used to check testing bars of Olin Aluminum for tensile, shear, compressive and twisting strength.

You create a new market every time you persuade a prospect that aluminum castings will improve his end product.

Olin Aluminum can help you prove that point in the first place . . . and can help you keep your customer "sold" thereafter. That's because we provide you with:

- **Primary metal—made to the most critical "specs" for your most demanding jobs.**
- **Prompt, thoroughly qualified technical assistance.**
- **Ready access to Research and Development.**

Join those firms that are expanding their operations by finding new and better applications for aluminum castings. Make Olin Aluminum your source of superior casting alloys —*and* of metallurgical know-how.

See us at the Philadelphia Castings Congress
Booths 1022-24 May 9-13

Member of American Foundrymen's Society

OLIN ALUMINUM®

OLIN MATHIESON • METALS DIVISION • 400 PARK AVENUE • NEW YORK 22, N.Y.

Aluminum Trade Freedom Urged . . . by Aluminium Limited's president

at Paris meeting of the Chamber of Commerce France-Canada. Europe's rising needs for aluminum can be met by outside suppliers if tariff barriers are lowered. See emergence of aluminum producers in under-developed countries in Africa, Asia, South America.

by Nathanael V. Davis, President, Aluminium Limited

DESPITE similarities between France and Canada, there are, in aluminum, significant differences. Even with one of the highest per capita consumption levels, Canada consumes only 15% of its aluminum. It has for many years served aluminum users all over the world, thus becoming the leading factor in international trade in aluminum. France has developed her aluminum industry chiefly for national needs. Because of a high tariff on aluminum —and, until recently, other import restrictions — users in France have relied almost entirely on national production.

I believe we are on the threshold of a new era in the industry. Only about 20% of the aluminum produced in the free world enters international trade today. The balance is consumed in the country where produced. But factors are changing this. We are going to see more aluminum produced in less industrialized areas and shipped to the more advanced countries.

Among the reasons for this coming change there is first the fact that it is becoming more difficult to obtain electric power for aluminum production in the industrialized areas.

Another reason: With aluminum consumption in the western world now over three million tons and promising to expand to higher levels, the transporting of raw materials — principally bauxite — to places where electric power is available in sufficient quantities, increases in significance. Only a small fraction of the many millions of tons of bauxite is made into metal at or near the mines, most of which are in tropical areas.

We already see a tendency to lessen the need for ships and port and railroad facilities by the location of ore-processing plants near the mines. Our company has built two alumina plants in Jamaica and is building another in British Guiana.

Similarly, French and other interests are completing the first alumina plant in Africa at Fria, Guinea. In the same country we have undertaken a similar project in Boke and are presently working on an international consortium, including French producers, for its realization.

As the transportation factor becomes more significant, there will be a tendency to place new smelters at locations offering large resources of both bauxite and electric power. The inevitable result will be a greater movement of aluminum in international trade.

This is one aspect of the new conditions in this decade, during which trade will become increasingly important. In 1959 all international trade in the western world totaled about $100 billion. By 1970 this may increase to at least $150 billion, and aluminum will add to the increase.

A shift to more international trade in primary aluminum will require dismantling of many measures used to protect local aluminum industries. Such a process is contemplated within the regional trade blocs being established in Europe. A similar process has been under way in the U. S. and Canada since before the last war.

In the Common Market . . .

An excellent opportunity for freeing world trade in aluminum is offered in the emergence of the Common Market in which tariffs of individual countries will be made into a single common tariff. If a low rate is selected, there will be freedom for manufacturers in the Common Market to buy basic raw material as they wish, making them more competitive with manufacturers in other areas and also able to meet the expanding requirements of the Common Market itself.

The interests of aluminum users in Europe deserve attention in setting the rules of trade with other areas, for it is they who will decide whether to use aluminum or some other material. More than one-fifth of the supply of aluminum for the Common Market now comes mostly from Canada and Norway.

Europe as a whole has now attained a remarkably healthy economy. In this resurgence, the rate of growth in aluminum consumption may well surpass the phenomenal growth in North America in the postwar years. Common Market countries will have to look more and more outside their countries for aluminum.

In the immediate future both Canada and Norway offer capacity, both existing and under development, which should meet the growing needs of the area. Looking further ahead, new sources of production will have to be developed.

A great deal of attention is being given to projects in Africa. There are also possibilities of large-scale aluminum production in Australasia, South America, and North America. A list of possible projects with undeveloped electric power potentials in the free world amounts to about 6,000,000 tons. Potential projects in remote areas will require many years and tremendous expenditures to bring them into production. Meanwhile the interim needs can be met from existing sources.

In suggesting that interim needs be served from existing sources such as Canada, and that trade barriers be reduced to permit maximum growth, I may appear to speak only from self-interest. Some may say that the aluminum companies of Europe need protection from the larger companies elsewhere.

This does not give proper credit to the preferential position of these companies in their home countries, being well integrated on the fabricating side and possessing large resources in other fields. Nor does it acknowledge their demonstrated ability as competitors in world markets.

Few will dispute that trade among friendly nations is desirable. In Canada the relation of foreign trade to total economic activity is high. The list of commodities exported from Common Market nations to Canada comprises practically all the products for which these nations are well-known.

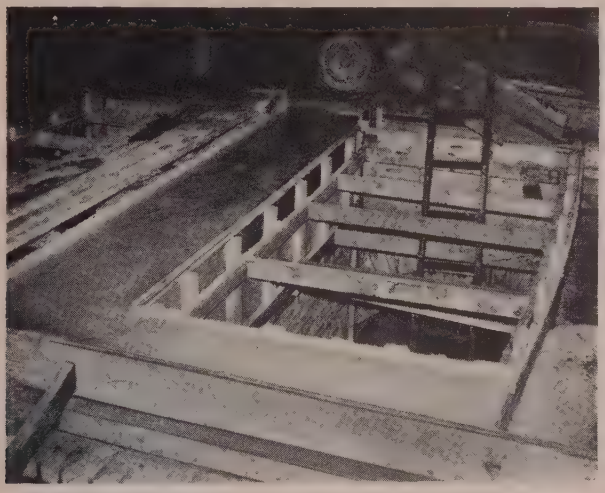
Canada is a growing market for French automobiles, iron and steel products, tractors, wines, clothing and other goods. Postwar trade between Canada and the six Common Market countries has been favorable to Canada, but this disparity has been greatly reduced. In some instances, as in the case of France, the balance of trade favors this country.

Canada's exports to Europe are mostly in products such as grain and basic raw materials, but with an increasing variety of finished products. Aluminum ranked third among Canada's exports to the Common Market area in 1959.

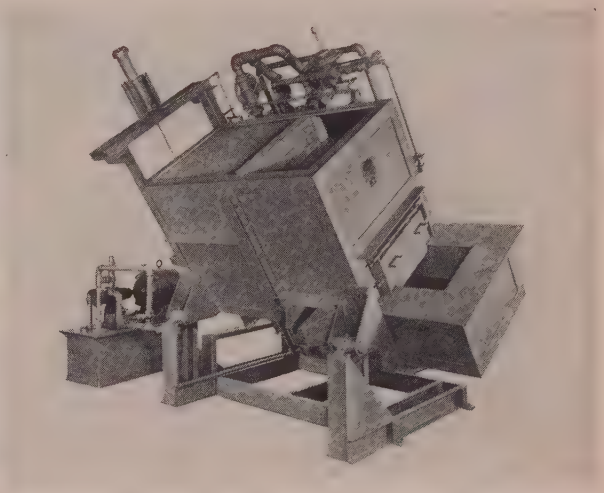
We stand for free trade in aluminum in the western world. I am happy to say that there are increasing indications that the benefits of liberal trade views are being given greater recognition.

In this stress-relieving furnace, B&W Kaocrete-D is used on the floor ledges, car top, in the door jamb and at the end of the flat roof where it withstands the abrasion of the door. This material is specially designed to withstand severe abrasive conditions and mechanical abuse.

Heavy duty car top service requires a high strength castable. B&W Kaocrete-D is excellently suited for this service at temperatures to 2500 F. B&W Kaocrete-32 is recommended for service above this range.



B&W Kaocrete-32 has been cast to form the curb walls of a soaking pit. When mechanical abuse from ingots damages the curb, Kaocrete-32 has the necessary properties to localize the damage, thus maintaining the serviceability of the rest of the curb.



The castable lining of this aluminum reverberatory furnace must have unusually high strength to withstand the considerable physical abuse of charging, operating and cleaning, while resisting the penetration of the molten metal. Kaocrete-D is widely used in this application.

How B&W refractory castables solve abrasion problems

Refractory castable linings used in metal-working furnaces are often subjected to severe mechanical abuse. Scraping by hand tools, loading and unloading, and the action of the molten metal and particle-laden gases all affect the life of refractories. Among B&W's line of refractory castables are two that are particularly suited to withstand unusual abrasive conditions. They are B&W Kaocrete-D and B&W Kaocrete-32, both of which have been used successfully in many demanding applications.

B&W Bulletin R-35A gives additional information on versatile B&W refractory castables. Write for copy to The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N.Y.

R606R

B&W THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.

Q. Which is BEST...

ALKYD...VINYL...

or ACRYLIC?

A. NONE-for everything!

New finishes, like new drugs, offer many new advantages. *Also like new drugs, however, none is a cure-all for all needs.*

Neither does successful use in one application assure success in another usage with requirements that differ, however slightly.

Some types of acrylics, for example, give important advantages as automotive finishes where expected durability is a relatively few years, where a high gloss is desirable, and where appearance can be maintained by cleaning and waxing.

It has not been established, however, that acrylics offer similar advantages for aluminum house siding where assured life expectancies up to 14 years and more have been established for other finishes—and where low gloss and self-cleaning are essential to appearance.

For these reasons, Sherwin-Williams *does not and will not* recommend only acrylics—or alkyds or vinyls—to the exclusion of the others.

Sherwin-Williams manufactures, supplies and maintains continuing research in all three types of product-finish formulations—as well as amines, epoxies, polyesters, latices and many others. Sherwin-Williams *has made and sold* acrylic materials as industrial finishes since 1937, alkyds since 1930, and vinyls since 1936.

Recommendations by Sherwin-Williams Laboratories are not made from the starting point of a raw material, but from the starting point of the *requirements of the end use.* With the largest laboratory facilities in the world devoted exclusively to paint research, this approach has been demonstrated to be consistently successful.

Sherwin-Williams Technicians will be pleased to make recommendations on product finishes for any end use—based on consideration of *all* the requirements of the end use, and on proved performance data. See your Industrial Representative or write The Sherwin-Williams Co., General Industrial Div., Cleveland 1, O.

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

A statement of importance to users of product finishes and coated metals, by The Sherwin-Williams Co.

HOW ALKYDS, VINYLS AND ACRYLICS COMPARE IN IMPORTANT PROPERTIES

PROPERTY	ALKYDS	VINYLS	ACRYLICS
Formability	Good	Superior	Fair
Exposure experience	Excellent	Excellent	Limited
Erosion resistance	Good	Excellent	Unknown
Hardness/flexibility	Good	Excellent	Good
Chemical resistance	Good	Excellent	Excellent
Pressure-marking resistance	Excellent	Excellent	Good
Economy of cost	1 (Lowest)	2	3

Builders and HIPsters talk big...

at two Chicago trade shows, but HIP Association leaders cite perils of shady practices; call for intensive educational program for dealers. Drop in home starts, tight money cast shadow on NAHB convention, but gains for aluminum seem certain.

by K. B. Rhodie, Associate Editor

BOTH exuberance and pessimism were evident at home improvement and home building shows held recently in Chicago, though the modernization people also displayed some apathy over critical industry problems.

The bright-eyed enthusiasts at the Home Improvement Products (HIP) Show all look for great things in 1960. At the same time Home Improvement Products Association leaders are forecasting a boom year – and decade – but are tempering their remarks with concern over the industry's reputation.

Aluminum's role in HIProducts is a vital one. Last year, according to David E. Winnick, director of the HIP Association, sales of aluminum doors, windows, carports and patios alone reached a total of $500 million. This will climb to $800 million by 1961, he predicts.

Siding Sales to Double

Thomas J. Lannen, Alcoa's manager of residential sales, says aluminum siding sales will more than double from the 90.7 million pounds used in 1959 to 193 million pounds by 1963. Siding sales are one of the major indicators in the home improvement industry. According to Alcoa research, 90% of all aluminum siding sold is used for remodeling.

More than 20,000 buyers jammed the aisles of Chicago's Navy Pier for the fourth HIP Show. Almost everybody –buyers and exhibitors alike–appeared to be unruffled by the pleas of industry leaders for straight-shooting operations which would foster industry integrity.

According to Don Moore of the HIP Show staff, the industry at first "was abused by opportunists who were trying to cash in on an exploding infant business" without taking time to create ethical practices and quality products with standards for installation.

When questioned on this point, many exhibitors apathetically observed, in effect: "You can't argue with success."

To this, Winnick says, "I don't feel particularly easy about the complacency among so many well-to-do firms. Prosperity is fine – provided it doesn't make you a fat cat and easy to trap. Now, when business is good and the 'golden decade' of still more prosperity lies ahead, we must work assiduously at keeping our business weight down."

Obviously, the HIP industry is a burgeoning one. Winnick predicts that more than $20 billion will be poured into home improvements during 1961. (This must include every conceivable cost item.) But even these soaring sales won't help a mismanaged firm, he cautions. Profit, not volume, is the important thing, he adds, and profit can be made only if managers take the time now to examine their industry and try to cure some of its ills.

Not enough outlets are handling the products consumers want, he claims. There are 170,000 logical retail outlets, including lumber yards, building products dealers, specialty, department and hardware stores who either don't handle any products the homeowner wants, or whose array is inadequate. What's needed to increase the number of items carried by them, says Winnick, is an educational program covering merchandising, research and finance.

HIP Association's Winnick

■ ***"I don't feel particularly easy about the complacency among so many well-to-do firms. Prosperity is fine – provided it doesn't make you a fat cat and easy to trap. Now, when business is good . . . we must work assiduously at keeping our business weight down."***

Another problem: "There are not enough installers, and many of those existing are doing the same things now as 30 years ago." Winnick believes the industry should support nationwide campaigns to educate and train craftsmen who can assure satisfaction and provide quality work that will meet accepted standards. If this isn't done "demand will increase eight-fold in the next few years and home improvers will lose many jobs as customers tire of waiting for the professional help they need."

Can't Handle Whole Job

Of the 170,000 retailers of HIProducts, only 10% do more than one type of job. "Only a handful have the manpower, experience, products and financing to complete a contract on their own," claims Winnick. And since the consumer himself is not fully aware of his own home improvement needs, it is up to the industry to activate desires, promote products, and educate the homeowner as to these needs.

Consumers do not know where to go for quality HIProducts, where to get top-flight craftsmanship, so the homeowner must act as his own contractor. To take this need out of the hands of the homeowner, Winnick suggests that several home improvers in a community pool their knowledge and goods so area consumers can get all the services and products they need from one source.

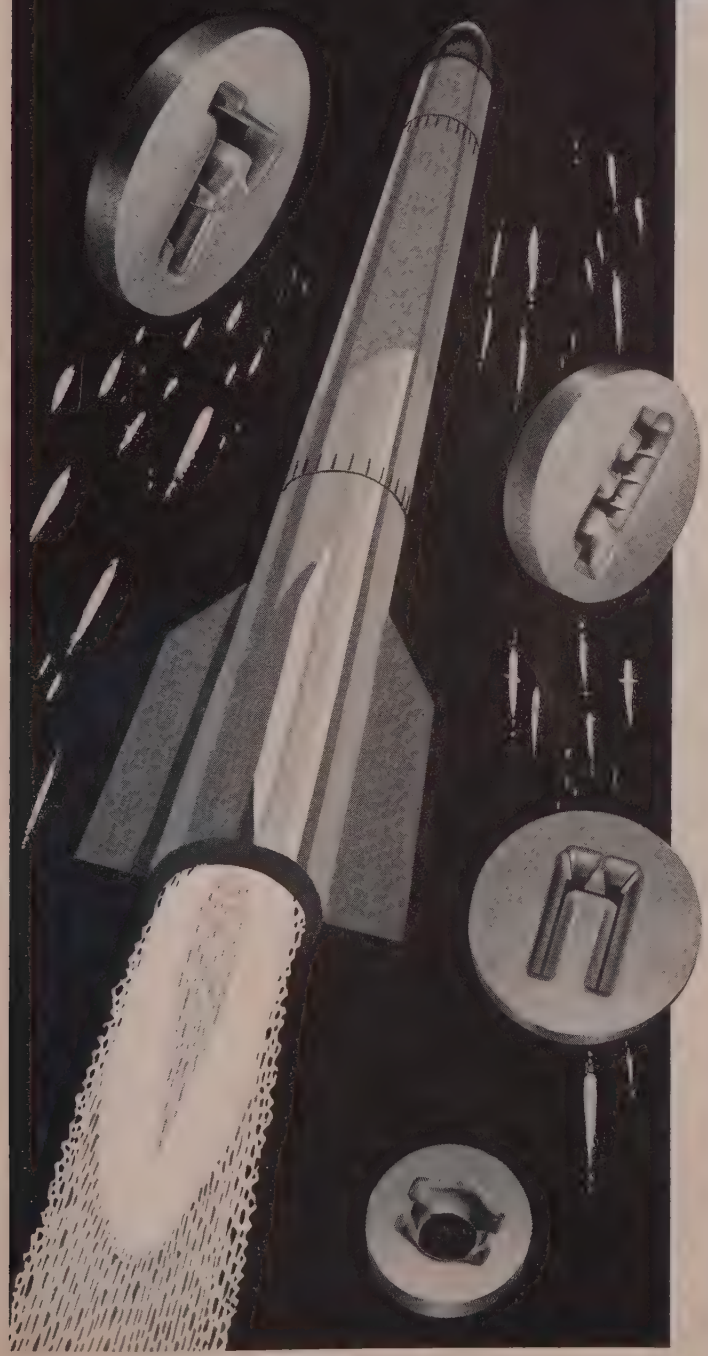
Fred C. Hecht, chairman of the Home Improvement Council, agrees. "The consumer has no place to go where he can be assured of getting the full range of home improvement products and services he needs," Hecht declared. Even if he does find someone who says he can deliver the goods, the homeowner has a natural suspicion – which, if we are to be candid, is justified by the record of abuses in this field."

He added that "retail management is often so slipshod that nobody makes a profit even when the other obstacles are overcome."

C. M. Flynn, Jr., president of Flynn

For extruding the metals of the

SPACE AGE



PMD

is now supplying

PRECISION CAST DIES

for the extrusion of:

- CHROMIUM
- TUNGSTEN AND MOLYBDENUM HIGH SPEED STEELS
- COBALT ALLOYS
- TITANIUM
- A286 STAINLESS STEEL
- COPPER BASE ALLOYS
- STEEL ALLOYS

PMD extrusion dies are designed and built to perform to your specific requirements by experienced extrusion Engineers. These Engineers are available to anyone having tooling problems. Call or write today.

PMD

PMD EXTRUSION DIE COMPANY

5747 BEEBE AVE. • WARREN, MICH.

Phone: COngress 4-2518

Write today for descriptive brochure

■ *Garage-Aire is a concept of indoor-outdoor living developed by American Screen Products Co. and Raynor Mfg. Co. American Screen produces the screened enclosure panels and sliding doors, while Raynor provides the overhanging garage doors. Raynor also handles merchandising and distributing through its door dealers and other qualified home improvement products distributors. Aluminum alloy 5005 is used for frame members and bolts. Supporting sections are roll formed, but two assembly pieces are extruded. Units have standard 7½ foot ceilings, but can have any floor-space dimensions in multiples of four feet, width of wall panels. Roof and wall panels are prefabricated and come packaged with all accessories needed for erection.*

Mfg. Co., Detroit, noted that in his product area — windows and doors — there are manufacturers a-plenty, but relatively few distributors. But he thinks that as more makers of poor products drop out of business, the ones who remain will form the basis of a strong industry.

One gross error, according to Flynn, is committed by firms that try to do too much themselves. They try to manufacture, distribute and install their products, and end up doing nothing well.

He warns that the industry will never have a reputable name as long as it starts new dealers off with free samples, and offers big discounts to large distributors. "Prices should stand for all, big or small, and products should be sold only to those who can pay for them."

Too Big to Predict

And while the growing pains of the still young industry are evident, so is its growth. Robert Pomerance, HIP Show director, notes that in addition to the new homes built in the next 10 years, 20% of the old homes will have to be remodeled and modernized, "creating a new market so vast that it is practically impossible to project its dollar volume."

If this prediction comes true, it can only be good news for the aluminum industry. Ben Cross, salesman at the Chicago branch of Aluminum Home Products Corp., expects aluminum's role in the home improvement field to become even greater as research and development create more products with new capabilities. This firm produces ALhom doors, windows, extrusions and siding.

Other aluminum product manufacturers also look for substantial growth. Lloyd Leslie, plant manager of Fetter Bros. Aluminum Mfg. Co., makers of windows, doors, marquees, prefabricated cottages, cabanas and enclosures, says his firm has chalked up a sales gain each year since it started business.

C. A. Stevens, Chicago district manager of Fairmont Aluminum Co., says January was a great month and the first week of February was the best in company history—"and we expect it to continue this way all year."

Edwin Shaw, sales manager of Ardmore Products Inc., manufacturers of textured metals, says this three-year-old firm has also upped sales each year. He attributes such growth to extensive promotion and a growing population composed of people becoming more and more home minded.

Wayne McAllister says that business of Alabama Wire Co. has been so good that the company has added new looms and expects at least a 20% gain in sales of its aluminum screen cloth.

C. R. Bradley, general manager of Weather Products Inc., says his company expects its top year after ending its best January. Increased sales of the company's awnings, railings, storm windows and ornamental columns are a result of a continuous program of promotion, advertising, education and dealer research, he adds.

Aluma Kraft Mfg. Co. tries to "not only be a supplier of construction materials, but also a supplier of sales tools to help dealers move awnings and siding products," says regional sales manager Bob Fauser. He feels this program will lead to a good '60, and to future sales expansion as well.

A myriad of products were displayed at the HIP show, though quality items were scarce. A serious atmosphere permeated the exhibition hall, however, and it would undoubtedly be correct to say that many more top-grade products were displayed this year than ever.

Speaking of storm windows and doors alone, Winnick says that standards and specifications of product performance, quality and installation have been established and manufacturers are adhering to them. A standard has also been proposed for awnings and covers.

Color is a major trend in storm windows. Flynn Mfg. Co. has just completed a new plant including a $100,000 Ransburg electrostatic spray painting installation. The firm now offers its entire line of storm windows and doors in seven baked enamel colors including white, black, green, pink, brown, copper and beige.

Color to Dominate

C. M. Flynn says that soon all aluminum windows and doors will be in color because the public is tiring of raw metal products. The company has its own extrusion presses, in addition to its new finishing equipment, and is able to turn out 2400 units a day.

American Screen Products Co. was showing a new concept in screened-in patios. The idea is built around a garage with overhead doors at both ends. A screened addition erected at one end doubles the enclosed floor space, and two large screen doors at the other end slide on tracks inside the overhanging doors.

During the summer this setup makes available to a family a large fun area and utilizes costly, and otherwise little used home space. At winter's start the screened enclosure is taken down, and the garage serves its original purpose.

Screening comes in aluminum or fiberglas, and structural framework is of anodized roll formed aluminum members. Other aluminum components include corner blocks, brace inserts, screws, nuts and washers. The entire package sells for about $1000 on a new home,

SUPERIOR CASTINGS, EXTRUSIONS, TRACED TO USE OF ACHESON COLLOIDAL GRAPHITE

The excellent lubricating properties of these materials have been proven under the severe conditions attendant to aluminum permanent molding and extruding. In the specific examples described below, smoother surface finishes, longer die life, and more uniform metal flow are chiefly attributed to the application of a 'dag' brand dispersion.

Fewer rejects, consistently higher quality castings are obtained at Paragon Aluminum Corporation by spraying 'Prodag' on their permanent molds as a pre-pour wash.

Better surface finish with Prodag® permanent mold coating is just one of the reasons why Paragon Aluminum Corporation, a Division of Detroit Harvester Company located at Monroe, Michigan, switched to this Acheson product. After four years of experimentation with other mold washes, Paragon chose 'Prodag' — Acheson semi-colloidal graphite in water — and has used it constantly the past seven years. The reasons for its choice are these: uniform consistency, excellent heat-transfer quality, and its hard, smooth, tenacious film which resists flaking and provides easier parting characteristics.

With about 95 per cent of its annual output of more than two million pounds of castings going to the automotive industry, Paragon must insist upon quality. 'Prodag' helps to maintain this standard. Parts for convertible automobile tops are precision-molded from both 355 and 319 aluminum alloy. Molds are pre-heated before each day's run to 600° F. and the casting cycle maintains this temperature. The 'Prodag' dilution ratio is 1 to 4 parts water and is applied to the molds with a commercial spray gun. Aside from occasional touchup at points of greatest wear, this coating lasts through the entire run. Because of the physical contours involved in these comparatively small, light castings, they require rapid cooling in certain areas to insure uniform strength. The 'Prodag' coating — with its proven fast heat transfer ability — allows the castings to cool without breaks or pinholes. And by parting more easily, the high-finish castings which result have given Paragon Aluminum products wide acceptance in this demanding industry. If you have a metal casting problem, write direct for additional information contained in our Bulletin No. 425. Address Dept. MM-30.

'dag', 'Aquadag', and 'Prodag' are trademarks registered in the U.S. Patent Office by Acheson Industries, Inc.

FASTER APPLICATION, LESS MATERIAL USED IN THIS EXTRUSION APPLICATION

Aluminum Extrusions, Incorporated, of Charlotte, Michigan, has realized a 30% savings in their material handling costs by the use of Aquadag® — Acheson colloidal graphite in water. They formerly had used an oil-graphite mixture which required a dilution ratio of 16 lbs. of graphite to a 55 gallon drum of oil. It was too slowly applied by swab and too coarse to effectively apply by spray.

With 'Aquadag', Aluminum Extrusions has a lubricant that is finer in particle size, permits wider coverage, and provides greater "sprayability". These minute particles pass freely through the spray nozzle, eliminating the costly downtime formerly involved in cleaning clogged equipment. The tough, dry film 'Aquadag' forms upon the evaporation of its water carrier, doesn't smoke or react when applied to hot dies and metals. This improves working conditions as well as extends die life. Important also to both die surfaces as well as the finished extrusion, is the fact that this durable, low-friction film allows easier, more uniform metal flow.

Acheson 'Aquadag', applied on die surfaces provides faster, more uniform application for Aluminum Extrusions, Incorporated.

If your problem is more effective lubrication under normally adverse conditions of extreme temperature, pressures, or abrasions, call in Acheson. In the meantime, write for your free copy of Bulletin No. 426.

ACHESON

dispersions digest reporting uses for

dag® BRAND DISPERSIONS

ACHESON *Colloids Company* PORT HURON, MICHIGAN

A division of Acheson Industries, Inc. Also Acheson Industries (Europe) Ltd. and affiliates, London, England

Offices in:

Boston • Chicago • Cleveland • Dayton • Detroit • Los Angeles • New York • Philadelphia • Pittsburgh • Rochester • St. Louis

but costs more if an old garage is converted for such use.

Richard Winters, vice president and general manager of the firm, looks for a 7 to 10% sales increase this year. A big percentage of this is expected to come from the garage-patio which, unlike the firm's other products, will be nationally advertised. In anticipation of sales increases the firm has already added 25,000 square feet of plant space, and installed a Hunter rolling mill. American Screen used approximately 6 million pounds of aluminum last year.

Alodized aluminum screening in four colors was shown by Hanover Wire Cloth Division of Continental Copper and Steel Industries Inc. The new Staralum screening is said to have high exterior visibility and is resistant to fog and salt air. It comes in green, gold, charcoal and bright. The firm suggests its use in terraces, patios, beach houses, etc.

Until now, all the screening the plant could produce was used to fill orders from national customers, but the addition of high speed looms and other equipment has raised production to the point where fabricators are able to get the product from other outlets.

Hopeful Home Builders

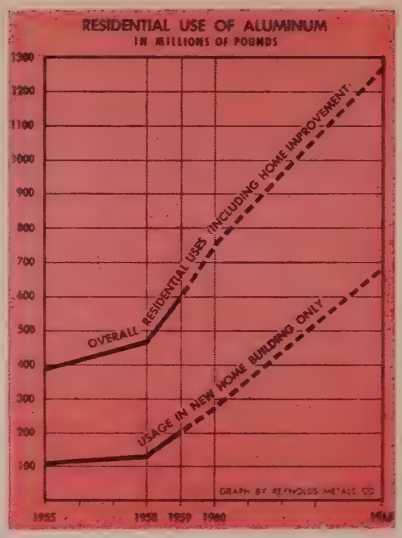
The Home Builders Show, "Patterns for Progress," was held three weeks earlier in Chicago's Coliseum and several Loop hotels. The 405 exhibitors had 809 colorfully decorated displays and many models to attract the 30,000 builders who milled through the aisles. The atmosphere was a gala one, despite predictions of a decline in housing starts in 1960.

John Dickerman, executive vice president of NAHB, told the convention that the current tight money situation would probably prevent builders from producing as many homes this year as last.

But home builders came to the show after an unusually brisk December which saw sales top those of November, and said they had to dispute claims that starts would lag in '60. They were supported by government statistics which showed that starts increased in November, and that by mid-December units were being hammered up at a yearly rate of 1.3 million.

However, a month later FHA Administrator Norman Mason predicted that starts would reach a point somewhere between 1.1 and 1.15 million by year's end. In February his office issued reports stating that starts dropped 9% during January, and were proceeding at an annual rate of 1.2 million. Mason felt this pace would continue.

But Ernest A. Becker, Las Vegas builder, was still hopeful, and was planning a new 320-acre development.



■ ***Graph shows how use of aluminum has climbed in last five years, and projects continued growth to 1965. As shown above, the overall use of aluminum in the home industry, including home improvements, will more than triple in the decade spanned.***

"The bank tells me to be conservative this year, but I don't see how I can be." His firm has been selling two or three houses a week since Christmas, "and that's pretty good when you consider our big sales push doesn't begin until March."

Richard Hipp, a builder from Minneapolis, says the people are out to buy. He doesn't know why, but "perhaps a lot of folks have taken a look at their balance sheet and decided that maybe things aren't too bad."

As the Wall Street Journal has reported, "Builders say financing is not the major stumbling block that they had expected it to be." Money is not abundant, but it is spread across the country in such a way that many small city lenders are almost anxious to take care of builders. Cash is expensive, but at least it is available for the time being.

Costs Keep Climbing

One problem that builders undoubtedly will encounter shortly is that of rising prices. Land costs are on the upswing, and suppliers have already warned of price hikes. Some builders have been absorbing slight increases so as to keep home prices steady, but, as Cedar Rapids, Iowa, builder Kenneth Borschel says: "I'm through absorbing all these cost increases. It's either pass the increases along or go out of business."

Sales in the Chicago area have been rapid, but Ralph J. Finitzo, president of the Home Builders Association of Chicago, cautions against looking at the figures too eagerly at such an early date. But if current rates continue through March. 1960's first half could end up far better than expected, he concedes.

But even if housing starts do dip in 1960, aluminum will still have a big year in this industry. Alcoa estimates that 450,000 tons of aluminum were used in the entire building industry in 1959. The average per new home was between 150 and 200 pounds. However, the company predicts that by 1965 more than 1000 pounds of the light metal will go into every new dwelling. This would bring the aluminum usage in new housing alone to one billion pounds, assuming 1,000,000 starts during the year.

Last year approximately 20,000 aluminum clad homes went up, compared to only 500 in 1958. David P. Reynolds, executive vice president of Reynolds Metals Co., predicts 45,000 aluminum homes for this year, and more than a million before the decade closes. He also sees a rise in the use of aluminum from the 150-pound-per-home average last year to 480 pounds by 1965.

As a further boost to the industry, Reynolds sees aluminum crashing the lower priced market in 1960. He looks for 1,275,000,000 pounds to be poured into housing annually by 1965 (see graph), and says this year's total should top 740,000,000 pounds.

Impetus From Prefabs

Two main factors will spark this drive to more aluminum consumption: More uses in home construction, and increased sales of prefabricated homes. Manufacturers say that of the 3000 items used in a home, 79% could be made of aluminum. In the future they look for it to be used extensively in plumbing, load bearing panels, porcelain enameled fixtures, and wall or floor heating surfaces.

Last year approximately 134,000 prefabs were sold, and some current predictions look for 160,000 units to go up this year. This is a major market for metal products. The country's largest home manufacturer, National Homes, sold 9500 aluminum units last year, and anticipates selling 18,000 this year.

Last year Reynolds had House of Ease packages for homes in the $18,000 to $55,000 range, but this year the program is being extended to lower price ranges which make up 85% of housing sales. Reynolds claims it is here that aluminum can make its greatest contribution to better living. "It offers families with moderate incomes beauty and comfort, while reducing those three R's of upkeep — repainting, repairs and replacement."

A recent Federal Housing Administration bulletin on maintenance saving

CORSON INDUSTRIES

ALUMINUM EXTRUSION FACILITIES

Corson Industries offers a complete extrusion service under one roof resulting in:

- New Manufacturing Economy
- Superior Quality Control
- Flexibility of Operation
- Fast, Efficient Delivery

As a leading independent manufacturer of Aluminum Extrusions for Industry, Corson Industries offers a Completely Integrated service, from drawing board to finished product, under one roof.

DIE MAKING . . .
BILLET CASTING . . .
HOMOGENIZING . . .
MULTI-PRESS EXTRUSIONS . . .
T-6 QUENCHING FACILITIES . . .
COMPLETE ANODIZING PLANT.

Latest production methods and strict quality control are your assurance on quality extrusions at economical prices.

A fully staffed department of experienced engineers are available to Corson customers to help solve your extrusion problems.

Corson Industries own fleet of fast trucks insures efficient, economical delivery. Large or small orders filled promptly.

Write, wire or phone today for information on how Corson Industries can benefit you.

COMPLETELY INTEGRATED

CI

A basic, reliable aluminum source with its own facilities for smelting, billet casting, homogenizing, die making, and multi-press extrusion operation and anodizing facilities.

CORSON INDUSTRIES

MAIN PLANT AND OFFICE
9000 River Road • Delair, New Jersey • NOrmandy 2-5500
CHICAGO OFFICE
5538 North Kedzie Ave. • Chicago, Illinois • INdependence 3-7030

Aluminum Shapes, Inc.
Aluminum Smelters, Inc.
Belmont Aluminum Co.
Parkside Distributing Co.

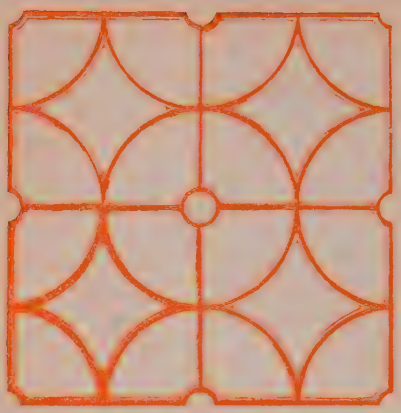
Please send me complete information on Corson Industries aluminum extrusion facilities and services.

Name ..... Title .....

Firm .....

Address .....

City ..... Zone ..... State



■ *Two grille patterns used in construction of decorative columns, partitions, etc. They are cast in aluminum by Tennessee Fabricating Co. Above is the Rhythm pattern, at right, Trend. A third design, Pace-Setter, was used extensively in House Beautiful's Pace-Setter home for 1960.*

materials is expected to assist aluminum's future in housing. The bulletin explains that under a new FHA policy home buyers can get a larger insured mortgage on a home using aluminum or other low-maintenance materials. According to the publication FHA observers have found that these materials greatly reduce operating expenses, and leave the householder with more available funds for monthly payments and other costs.

FHA offices now carry data which help builders estimate home expenses, including operating and upkeep costs. There appears to be a tendency to make estimates without regard to differences in maintenance resulting from use of alternate materials and equipment, says the FHA. It points out that over-estimates of maintenance, annual heating and operating costs can affect mortgage credit decisions to the point of excluding significant segments of the possible home buying market.

Kaiser's Big Pitch

Many interesting items were shown by the more than 100 aluminum home products manufacturers at the show. The bulk of the displays were devoted to doors and windows, both prime and storm, for industrial and residential application. Other popular aluminum items included carports, patios, lawn screen houses, pool enclosures, etc.

Kaiser Aluminum showed building components for doors, soffit and fascia, and Bermuda-type roof systems. The entrance door system is composed of a complete aluminum frame and threshold with a pre-hung textured aluminum-clad door. Frame exterior is insulated from the interior framing, the insulation also providing necessary weather-stripping.

Kaiser developed the system to speed up door framing and hanging. It is installed by simply placing it in the rough framed door opening, accurately setting it, and nailing it in place by the attached tabs.

Special fasteners have been included on the soffit and fascia system so the panel can be easily locked in place. Brackets and framing have been eliminated. Louvered panels provide necessary soffit area ventilation and come pre-finished in white that can be repainted.

Bermuda roof panels are of diamond patterned aluminum sheet over a solid core, are pre-finished in white, and packaged for protection. With 14½ inches of exposure per panel, the roof can be installed quickly. A waterproof joint system speeds assembly. The roof system is designed to be installed on rafters spaced 24 inches apart, with pitch varying from 3 to 5 inches per foot.

Aluminum framed glass sections reaching from floor to ceiling compose the new Glasswall units displayed by DeVac Inc. Glasswall can be used to enclose porches or to partition rooms. Each section has three sliding windows with removable screens. The base section is hollow so heating lines or wiring can be installed.

Bertram F. Given, president of Waste King Corp., forecast that 61% of the 1960 housing starts will have built-in gas or electric ranges and ovens. This will eat up a lot of aluminum since it is used extensively as a decorative trim in this and other lines.

Kelvinator has put aluminum to work to save the housewife some extra toil. Its new built-in ovens come with replaceable aluminum foil liners that are thrown away when dirty, leaving an oven interior as clean as new. Aluminum drip pans under burners are easily removed and soaked clean. An accessory is a broiler pan with aluminum grill.

Tennessee Fabricating Co. was showing a new line of cast aluminum decorative grilles which, according to president Abe Sauer, were "overwhelmingly accepted by the builders." The units come in three designs, and each non-directional 18 by 18 inch component comes pre-drilled for installation.

One of the more interesting aspects of the show was a report on the NAHB research house built last year in East Lansing, Mich. Aluminum foil plays a major role in the home and aluminum sheet and extrusions were used for decorative and cost-cutting purposes.

Robert Schmitt, chairman of the NAHB Research Institute, cited two basic objectives in the development of the house. First, to devise a system which would minimize the delaying effect of inclement weather on construction; second, to attempt to build a two-story house using one-story component methods. This meant that as much concrete work as possible had to be avoided.

Use Lots of Foil

The most prevalent use of aluminum was foil in roof and wall panels. To limit concrete work it was necessary to devise a waterproof and vapor resistant component panel which could be placed below grade. Plywood skins were chosen and protected with a bonded covering of aluminum foil, which in turn is protected by a coating of textured Hypalon. The panels are 5 inches thick to resist horizontal thrust of earth pressure.

The 5-inch thick roof panels, 4 by 12 and 4 by 16 feet, have plywood skins, a foamed polystyrene core, and are wrapped in aluminum foil. The panels were factory coated with a textured urethane, and the joints were taped to match after erection. More foil was used to back gypsum board in the first floor ceiling, and the same combination was used to form some duct in the heating and cooling system.

Other aluminum products used in the home include fasteners, insulated jalousies, handrails, grilles, and prepainted gutters. Sheet channel is used to form door casing and trim. The tub enclosure has an aluminum frame. Extrusions support wooden kitchen cabinets.

The 2100-square-foot house is of contemporary 2-story styling, and has four bedrooms, two and one-half baths, and an attached garage. The only part of the house which cannot be built during winter is the foundation. This can be poured during the summer, and the house completed anytime afterward.

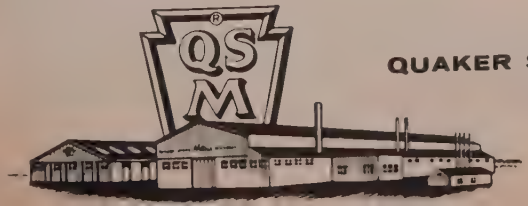
MODERN EQUIPMENT PRODUCES *Quality Aluminum*

Inside QSM's new cast house the most advanced equipment and metallurgical techniques have been combined to produce aluminum alloy rolling ingots of exceptional quality.

For productive efficiency two custom-built Swindell-Dressler melting furnaces have been set up with two companion holding furnaces in tandem. Molten metal is transferred directly from melting to holding furnaces after the industry's most modern fluxing has been completed.

As a final assurance of top quality, the melt is held in a "tranquil bath" until filtered at a controlled rate through glass cloth screening into the molds.

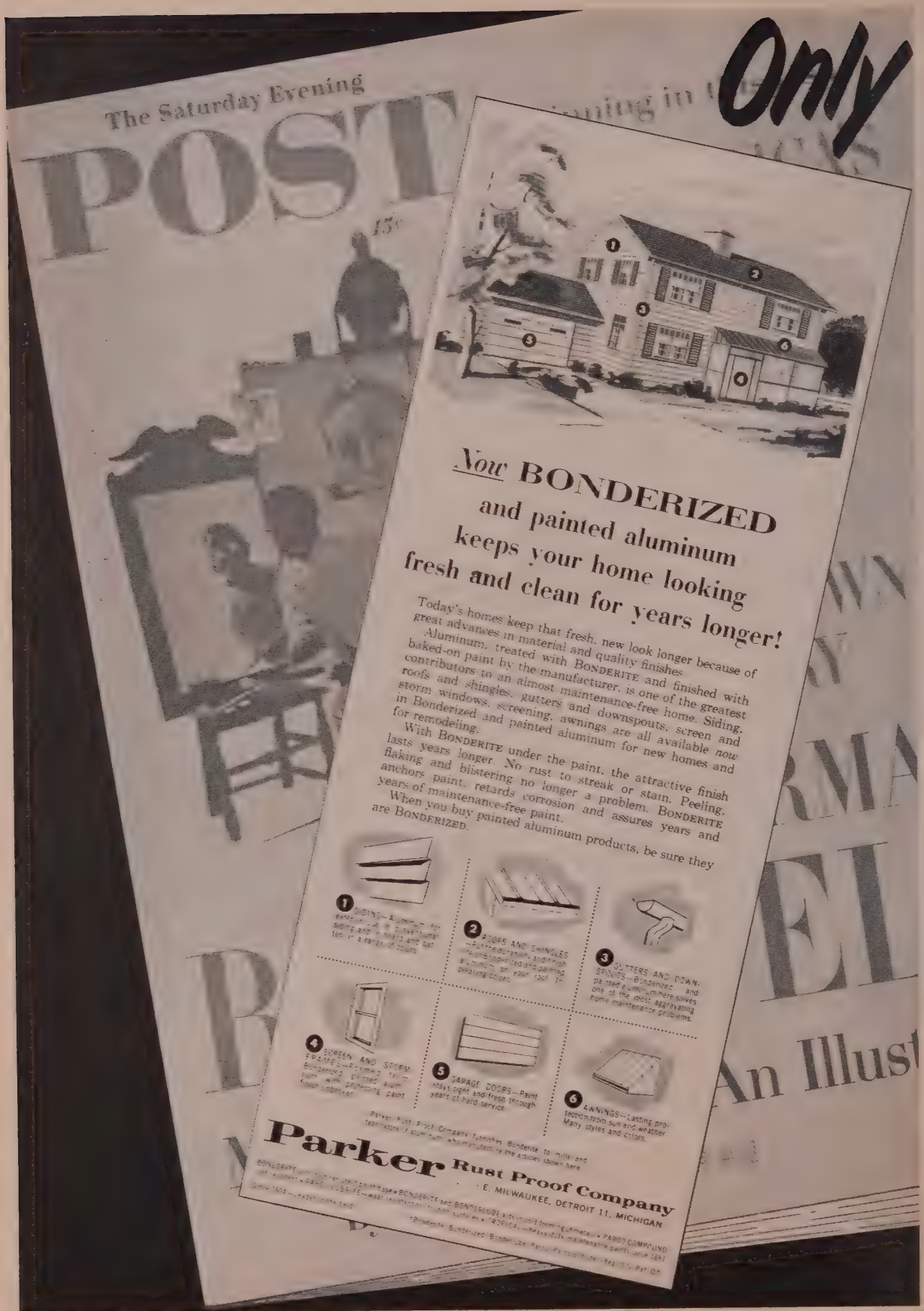
The resulting ingots will meet QSM's exacting standards and insure you of quality aluminum sheet and coil.



QUAKER STATE METALS CO. • LANCASTER, PA.

A Division of HOWE SOUND COMPANY

Mill Producers of Aluminum Sheet and Coil


The Saturday Evening
POST
Only
Now BONDERIZED
and painted aluminum
keeps your home looking
fresh and clean for years longer!
Today's homes keep that fresh, new look longer because of great advances in material and quality finishes.
Aluminum, treated with BONDERITE and finished with baked-on paint by the manufacturer, is one of the greatest contributors to an almost maintenance-free home. Siding, roofs and shingles, gutters and downspouts, screen and storm windows, screening, awnings are all available now in Bonderized and painted aluminum for new homes and for remodeling.
With BONDERITE under the paint, the attractive finish lasts years longer. No rust to streak or stain. Peeling, flaking and blistering no longer a problem. BONDERITE anchors paint, retards corrosion and assures years and years of maintenance-free paint.
When you buy painted aluminum products, be sure they are BONDERIZED.
1 SIDING—
2 ROOFS AND SHINGLES
3 GUTTERS AND DOWNSPOUTS—Bonderized and painted aluminum solves one of the most aggravating home maintenance problems.
4 SCREEN AND STORM FRAME
5 GARAGE DOORS—Paint stays right and fresh through years of hard service.
6 AWNINGS—Lasting protection from sun and weather. Many styles and colors.
Parker Rust Proof Company
E. MILWAUKEE, DETROIT 11, MICHIGAN

Bonderite helps you sell!

PARKER NATIONAL ADVERTISING TELLS YOUR CUSTOMERS ABOUT THE

EXTRA VALUES

YOU ADD WITH BONDERITE FOR ALUMINUM

Here's the latest in the 30-year-long series of Bonderite national advertisements, developing broad knowledge and acceptance for Bonderite as an added value on painted products.

This half-page ad, appearing in The Saturday Evening Post, tells how Bonderite, in the wonderful world of aluminum, increases durability of paint on the many aluminum products used on modern homes.

Remarkable advances in Bonderite for aluminum have made this treatment a virtual requirement before painting aluminum. It provides sludge-free, continuous operation, with quality of coating and efficiency of the solution checked by a constant, accurate, visual color control. And the Bonderite solution operates indefinitely without dumping. In one plant, quality coatings have been obtained for over three years from a solution which continues to operate without any reason for discarding.

Bonderite is the corrosion-resistant paint bond which is known by name and reputation to your customers. Put this acceptance to work for you by using Bonderite in your finishing operations — and by using Bonderite as a product feature. It can help you sell!

Parker Rust Proof Company
2198 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base • BONDERITE and BONDERLUBE aids in cold forming of metals • PARCO COMPOUND rust resistant • PARCO LUBRITE—wear resistant for friction surfaces • TROPICAL—heavy duty maintenance paints since 1883

Since 1914—Leader in the field

*Bonderite, Bonderized, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

Get full details on Bonderite for aluminum. Check the information you want on the coupon at right. Mail it today!

PROTECTED BY Bonderite QUALITY CORROSION RESISTANT

PARKER RUST PROOF COMPANY
2198 East Milwaukee Avenue
Detroit 11, Michigan

☐ Send me literature on Bonderite for aluminum.
☐ Give me details on Bonderite as a product and sales feature.

Name_____
Title_____
Company_____
Address_____
City_____ State_____

Missile guidance gear demands . . . PRECISION WELDING OF ALUMINUM

THE WELDING of component parts for missiles and rockets used in the nation's military and space exploration programs requires precise production control and workmanship which will guarantee a very high degree of reliability and performance.

Recently, Glasco Equipment Corp., Paterson, N.J., took on an exacting welding job involved in the fabrication of aluminum housings for azimuth alignment theodolites built by the Perkin-Elmer Corp., Norwalk, Conn.

The theodolite housings fabricated by Glasco contain electronic optical systems developed by Perkin-Elmer to set and control the azimuth heading for missiles and missile guidance systems up to the moment of launching. Azimuth alignment theodolites of this type are already in use on, or are being produced for, the Atlas, Thor, Jupiter and Mace missiles.

The housings, made of 6061-T6 aluminum, are composed of three parts; base plate, cone, and spider assembly. The spider assembly is welded first. It consists of four uprights of ½-inch aluminum plate which are welded together at right angles to each other. The outer edge of each upright is contoured to the slope of the cone which will later be fitted over it.

After the spider assembly is completed, it is welded to the base plate which measures 28 x 28 inches and is made of 1-inch thick aluminum plate. The third step in the operation is the welding of the cone.

Cones are constructed of two identical pieces of curved plate, seam welded vertically. They are made of .081 aluminum sheet and are of two sizes. The smaller is 48 inches high, 42 inches in diameter at the base and 6¾ inches in diameter at the top. The larger cone is 68 inches high.

Turntable Rotates

The cone is welded to the base plate and spider assembly on a turntable after it has been seam welded. The turntable rotates the entire housing, allowing the operator to sit in one spot during the entire operation. The operator first tack welds the cone to the base plate, then welds the entire circumference of the cone using an Aircomatic MIGet gun.

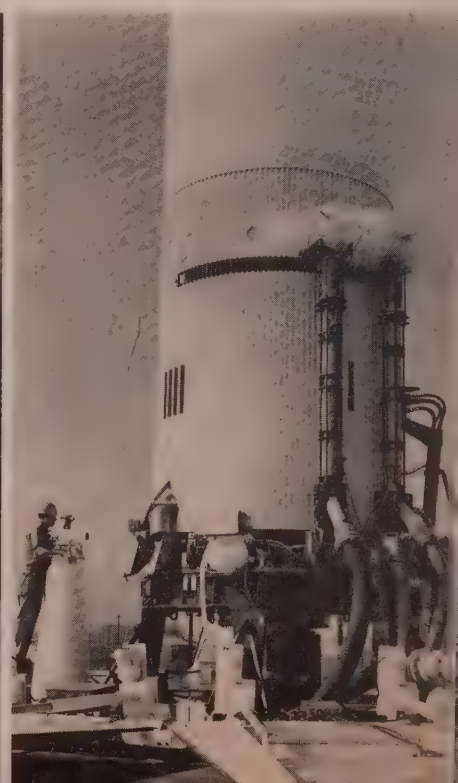
Later, plug welds, fastening the cone to the spider assembly, are made using the Heliwelding (tungsten-inert-gas) welding process of Air Reduction Co.

All of the welding except the plug welds is done with the Aircomatic process, Air Reduction's method of gas-shielded metal-arc welding, using a consumable electrode. It is particularly effective in welding aluminum, in this case both thin and thick sections.

For welding the cone to the base plate, the MIGet Aircomatic gun was used for both tack and finished welding. The MIGet gun is a lightweight welding gun for all-position welding. Containing its own drive rolls and a spool of consumable welding wire, it is extremely adaptable for welding in hard-to-get-at places.

Welding done on the housing for the azimuth alignment theodolites was accomplished using 1/16-inch Aircomatic aluminum welding wire, type A43, with pure argon serving as the shielding gas.

Glasco welders are ASME approved and certified by all the armed forces under MILT-5021 to work on government projects where superior welding methods are demanded. The company's long experience in the fabrication of stainless steel and aluminum components makes them fully qualified to use all existing welding techniques with results well within the range of exacting specifications.



■ ***Exacting specifications make welding of azimuth alignment theodolites a critical factor in missiles and rockets. Photo (left) shows cone housing being fitted over spider. Center, operator welds circumference of cone to theodolite base plate. At right, theodolite shown in use. Azimuth heading of Jupiter rocket must be monitored until moment of launching.***

Better than New!

View of mill housings in process of re-machining

This Five Stand Tandem Hot Finishing Mill has been in use for many years in the Pittsburgh Area. It is being completely modernized with the latest design features including automatic screwdown, improved anti-friction roll neck bearings, etc. Then the original mill, in better than new condition since equipped with these modern features, will be operated in the Chicago District for many future years of competitive service in the steel industry.

As Builders of Rolling Mill Equipment, we will be pleased to quote on your requirements for re-built or new installations.

"Electric and open hearth steel castings from 1 lb. to 100 tons"

HEAVY MACHINING FACILITIES

Our plant is equipped with a superior complement of well diversified machine tools that are available on a continuing basis for economical machining of heavy castings or the manufacture of auxiliary rolling mill equipment, such as heavy mill tables, furnace pushers, slab depilers, downcoilers, ingot buggies, slab transfers, etc.

PITTSBURGH

ENGINEERING & MACHINE DIVISION

TEXTRON, INC.

Welded Aluminum Tube *is a mass production reality for a group of companies in England that started out with radio aerials 25 years ago; now produce TV antennas, summer furniture and tube for users in Britain, other countries.*

"COILS of aluminum sheet up to 36 inches wide and weighing 2 tons or more are delivered by a stream of lorries to the factory where they are seized, slit to the appropriate width, and fed into two machines that greedily devour the aluminum strip, making it into tubes of various diameters and wall thicknesses."

Scene of this frenzied activity is Elm Engineering Ltd., Aylesbury, Bucks, England, and narrator is H. F. a' Brassard, sales director of the company. Elm Engineering is the tube manufacturing member of what is called "the Antiference Group of companies." Behind the formation of this group is a success story that might well have taken place in Youngstown, Ohio, or Dade County, Florida.

Seems that a radio repair man named Norman Best heard so many complaints about interference with existing antennas that he whipped together a design that licked the problem. With a capital outlay of £80, he and his wife set up Antiference Ltd. and began making antennas.

That was about 25 years ago. "Today," declares a' Brassard, "the group is probably the largest television aerial manufacturer in the world, and certainly the largest aluminum alloy user in the United Kingdom."

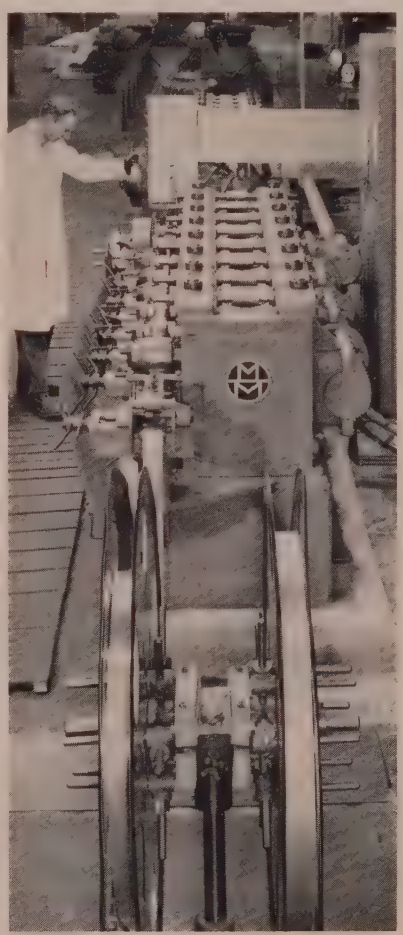
Extravagant as these claims may sound, Antiference *is* a large user of aluminum tube — so large, in fact, that Best and his associates have set up their own tube making plant, the one where coils of aluminum strip are seized and slit and greedily devoured by a high speed tube welding installation.

Production capacity of this plant is so large that Antiference has branched out into other product fields — casual furniture — and still has enough excess capacity to supply other tube users in the U. K. and other countries.

The aluminum used is an alloy containing 0.1% copper, 1.8-2.7% magnesium, 0.6% silicon, 0.7% iron, 0.5% manganese, 0.1% zinc, and 0.5% chromium. The metal has a yield strength of 33,152 psi, a tensile strength of 38,752 psi, and elongation of 5%.

Strip is produced to the required gauge with a tight tolerance of ± 0.002 inch, and since the outside diameter is controlled by sizing stages to ± 0.005 inch, the ID and OD dimensions are held accurate.

This strip is made into tubing by special high-frequency resistance welding equipment developed by New Rochelle (New York) Tool Corp., who has given Elm sole manufacturing rights in England.



■ *View of entire tube forming mill and welding station. In front, coiled strip can be seen as it is fed into mill, and the path it takes through forming rolls, past electrodes, under welding head and pressure rolls and finally to the flying shear which lops off tube lengths.*

In high-frequency resistance welding the current is reversed at 450,000 cycles per second. It doesn't travel along the direct low resistance path between the two electrodes, but takes the longer course of the low inductance current (see diagram). Normally, when low-frequency is used in resistance welding, the current travels at right angles to the axis from one piece of metal to another.

This means the resulting weld heat is a product of current, pressure of the two surfaces, the metal's surface condition, and other variables which can cause trouble with light alloys.

The New Rochelle machine is operated by one man from a single control panel. The welding head can be adjusted by one of two methods. The first, used with variable forming mill speeds, has a bar-type reactor wired in series with one weld head lead. The bar acts as a shorting unit which, when adjusted, alters current flow to the weld zone.

A smaller series reactor which permits adjustment while the power is on is used in the other method. A copper block with a small hole acts as an inductor when installed in series with a weld head lead. Current is adjusted by a reactive changing device which can be run by a motor responding to impulses from an electronic gauge inspecting weld heat as work passes the electrodes.

Elm's tube mill consists of two sections: the forming mill and the welding unit. Strip is fed into the mill from a coil mounted on a rotatable stand. It holds one coil on each side so reloading can be done while the other reel feeds strip into the machine. The aluminum goes through eight pairs of rolls which progressively form it into an almost closed circle, then passes through a seam guide which predetermines weld gap.

To join the strip the welding head first heats the edges with a high-frequency current. Next, the metal passes through pressure rolls which fuse it into tubing. Then, two scarfing tools clean all external flash. After scarfing, four roll stages size and straighten the tubing and a flying shear cuts it into lengths

Hands of the Giants

crack an egg or shape a missile

100,000,000 lbs. of pressure—so delicately controlled that it can be made to crack the shell of an egg. Use the fabulous forces of present day forging skills to crack the barriers of space—weight, strength, high temperatures. Forge the future, today.

EST. 1883

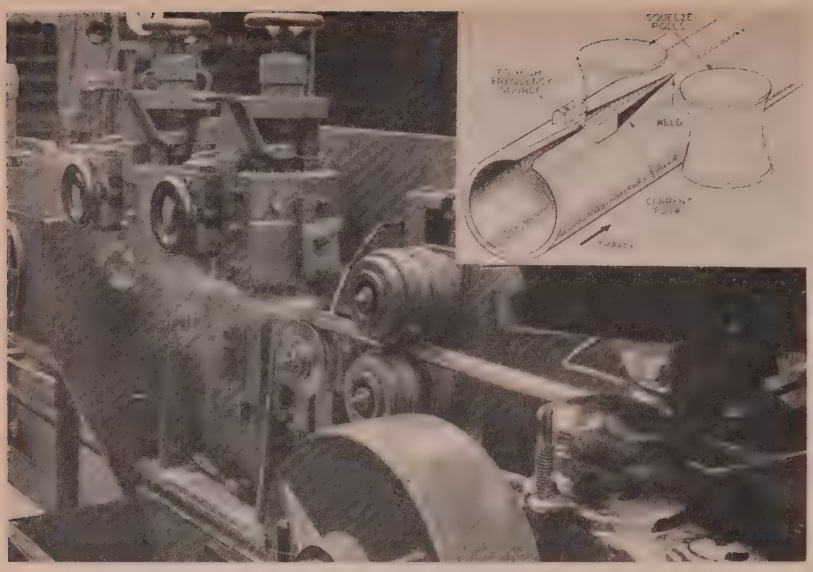
WYMAN-GORDON

FORGING

ALUMINUM MAGNESIUM STEEL TITANIUM BERYLLIUM MOLYBDENUM COLUMBIUM
AND OTHER UNCOMMON MATERIALS

WORCESTER, MASSACHUSETTS

HARVEY, ILLINOIS
DETROIT, MICHIGAN
GRAFTON, MASSACHUSETTS
FORT WORTH, TEXAS
FRANKLIN PARK, ILLINOIS
LOS ANGELES, CALIFORNIA



■ *Welded aluminum tubing is shown leaving welding head at left. At lower right, welding electrodes ride the tube just before it enters the pressure rolls. Inset sketch shows how Vee of tubing is formed prior to welding, and how welding current travels its route from one electrode, through weld, and back to second electrode.*

which are automatically discharged.

Forming rolls are made of high-carbon, high-chromium steel, and pressure rolls are of phosphor bronze. Aluminum pick-up on the rolls caused trouble at first, but this has been almost completely overcome by strategically placing wire wool pads which keep the rolls clean.

Weld Heat Concentrated

"Using the New Rochelle welding head, perfect tubes are welded at rates of up to 300-400 feet per minute and the tube is dimensionally accurate to all commercial tolerances including straightness," comments a' Brassard. "One principal advantage is the constant wall thickness, ensuring a regular footage per pound for any given size."

Heat concentration on the immediate weld area (see drawing) is the most important feature of the welding head. This is accomplished by two water-cooled electrodes and a high-frequency transformer which provides an input of 300 kva and 50 kw. The electrodes are connected to the output terminals of the transformer and are fed 100 volts through two water cooled leads. Electrodes can be used for about two weeks, during which time many hundred thousands of feet of aluminum tubing can be welded.

These electrodes ride the tube's surface, one on each side of the seam, just before it enters the pressure rolls. The seam forms an acute Vee with the edges just touching at one end and opened slightly at the other. Current flows from one electrode, along the surface of one arm of the Vee to its vertex, through the weld area, then back along the opposite seam edge to the second electrode.

This localized method heats the weld area to the required temperature at the same rate of speed of the strip traveling through the forming rolls. The method also pinpoints the heat path, limiting annealing and deformation of the metal, and cuts power requirements.

In producing small diameter tubing, the inductance path around the rear of the strip is sometimes so low that current will flow in this area, deflecting heat from the weld zone. An impeder, a water-cooled magnetic core inserted in the tube under the electrodes, was developed to eliminate this. It makes sure that maximum welding current is available.

Form, Flatten, Pierce, Draw

Tubing produced by this method can be formed, flattened, pierced, swaged or redrawn without subsequent failure, says Elm. It can be polished, anodized, lacquered or electro-brightened. Tube comes in five wall thicknesses ranging from 0.028 to 0.080 inch, and in seven outside diameters ranging from ½ to 1½ inches.

For its own purposes, Elm polishes tube before it is formed into furniture. But the firm reports that many outside customers who have their own color anodizing and electro-brightening facilities, purchase unpolished material and finish it themselves.

Many tests were conducted to determine tube and weld quality. Drift of coning examinations showed that when tubes were coned to 30°, an increase in diameter of over 25% can be realized wtihout failure. Another test showed that continuously welded ¾-inch OD tube can be formed to a right angle with a radius of two inches by cold bending without mandrels.

"Generally," according to a' Brassard, "the tube will satisfactorily form around 2 to 2½ times its diameter. Where thinner wall and larger tube is concerned, material with a greater elongation has to be used."

Piercing the tubing, the weld, or piercing at right angles to it or at any intermediate position results in no detrimental effect on the tube, he adds. And micro-examination of the weld shows it to be completely homogeneous and free from oxide inclusions. In an attempt to test the weld's ductility, tubing was successfully redrawn through dies to a much reduced wall thickness.

Elm supplies its own plants with tube, and also distributes it commercially.

"In addition to supplying our own captive market in the shape of Antiference Ltd., the production capacity of the equipment means that we can go into the open market and offer aluminum alloy welded tube," a' Brassard explains.

Exporting Tube, Too

"This is the first time that such a production has been put on the market in the United Kingdom. While many customers are obviously competitors of the group, this appears to make no difference because the tube is first-class.

"In addition to selling tube in the U. K., considerable export business is done with other countries, including Canada. A year ago firms making garden furniture from aluminum alloy tubing could only purchase conventionally drawn and extruded tubing."

Elm Tube has been on the market since early 1959, and "there have been no returns from either our own company or the outside customers for reasons of the tube being out of dimensional tolerance, or the weld opening."

The tubular line of the Mercury Furniture Division is an extensive one. It includes an upholstered armchair, several styles of garden chairs, a rocking chair, deck chair, bridge chair and chaise lounge. Accessory items include parasols, occasional tables and stools. And a' Brassard says that "on the cards are other new lines using aluminum in one form or another." All the products fold for storage and are covered in various colors of canvas, rayon or cotton.

A variety of aerials are produced, with the firm offering three types of television antennas, each having many variations. Also manufactured are inside television aerials, radio and car aerials. Other items sold by Antiference include plugs, sockets, coaxial outlet boxes and other electrical accessories.

FORMERLY AVAILABLE ONLY FROM ABROAD—

Ano-coil®

COLOR ANODIZED ALUMINUM STRIP IN COIL

IS NOW BEING PRODUCED IN THE U.S.A.

For the first time since we introduced West German-made ANO-COIL to American industry—and ran into more demand than we could deliver—we are now able to assure a prompt, steady domestic source of supply for this colorful material in gauges from .040″ down to foil as light as .002″.

But we had to build a plant here to do it.

It's already in operation at Rockville, Conn. Continuous anodizing and dyeing equipment is producing ANO-COIL by the same fully automatic process that distinguished the quality of the imported product. Color uniformity and finish are electronically controlled throughout the coil. A wide variety of embossed and perforated patterns is being made.

Now, all the sales appeal and production economy of this color anodized aluminum strip are within easy reach. Advantages like—

Pre-finished coils permit continuous automatic feeding.

Coating is flexible for roll forming and shallow drawing.

Finishing after fabrication is completely eliminated.

Anodized coating won't tarnish. No lacquer overcoating is needed to preserve its brilliance.

Color is consistent—no matching problems.

No electrode marks, hence no waste to cut away.

Savings—often as much as 50%—over conventional dip-by-batch methods.

ANO-COIL is currently being used for such diverse products as decorative trim, buttons, name plates, wall tiles, weather stripping, molded knob inserts and roll-formed tubing, furniture moldings and trim, to name but a few. Applications are limited only by your imagination.

If you've never used aluminum before, ANO-COIL may be the best thing that could happen to your product. If you are using aluminum now, ANO-COIL may well put you on the road to a more efficient, more profitable operation. Send for samples and see.

ANO-COIL strip will now be available in standard colors including gold and brass, in commercial size coil widths up to 24″.

FROMSON ORBAN SALES CORPORATION

253 Madison Avenue, New York 16, N.Y.

Ramjets Rely on Mag-Thorium Castings

Casting cuts costs, and the new magnesium alloys hold their strength at high temperatures. But problems arise in design, foundry practice, quality control, corrosion prevention, and joining. Here's how one user solves them.

by C. P. King, Marquardt Corporation, Van Nuys, Calif.

WHEN thorium and the rare earth elements were alloyed with magnesium the resultant strength of the alloys at elevated temperatures attracted missile designers. Then, the combining of one of the oldest fabrication methods — casting — with one of the newest alloys — HK31 —opened up new avenues of design.

The first use of HK31 castings by Marquardt was in 1952. Since then our applications of the alloy have spread to many models of ramjet engines and many components, at the same time utilizing almost every known means of casting metal to a desired configuration. The application of the HK31 casting alloy to one advanced ramjet engine program alone encompasses almost 70 castings ranging from one ounce to over 100 lbs.

Foundry techniques employed include green sand casting, permanent mold, investment casting, dry sand casting, baked core assembly and shell mold casting.

Many combinations of these have been effectively used to overcome individual problems. Permanent mold with shell cores and permanent mold with baked sand cores are two examples.

The chemical composition of HK31 is 2.5 to 4.0% thorium, 0.5 to 1.0% zirconium, 0.3% maximum impurities, balance magnesium.

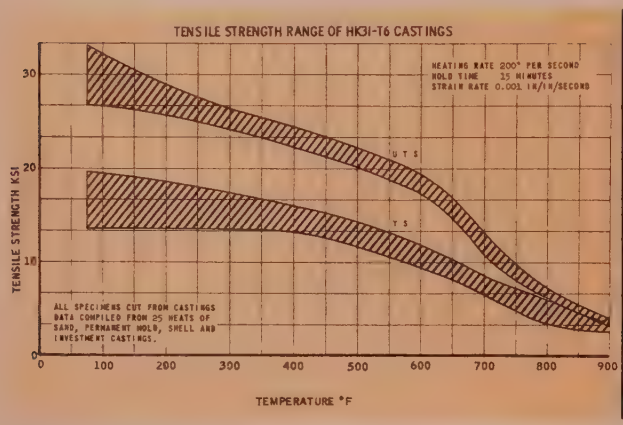
How Much Thorium

The effect of thorium in raising the elevated temperature strength of magnesium is well known. In fact, increasing the thorium addition up to 20% increases the ultimate and yield strengths of magnesium at any test temperature. But since the higher thorium contents achieve this at the expense of ductility, 3% thorium was selected as the optimum level.

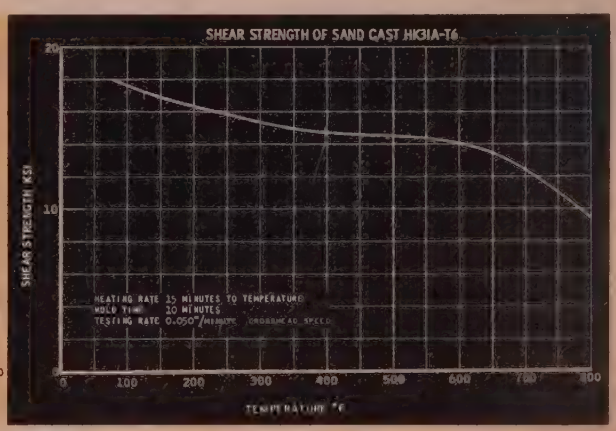
Zirconium is added primarily for grain refinement. Added to the 3% thorium alloy, zirconium not only increases the strength properties by greatly reducing the grain size, but also improves fluidity and lessens the tendency to microporosity.

The only temper in which HK31 is normally used in castings is T6— solution heat treated and aged — achieved by holding at 1050°F for 2 hours, air cooling, then aging at 400°F for 16 hours.

For the solution treatment, an atmosphere of at least 2% SO_2 gas is necessary. The same atmosphere is preferred for aging, although an air atmosphere may be used. During the solution treatment, accurate control of temperature is essential because of the proximity to the melting point of the alloy. A small amount of deformation may take place during solution treat-



■ *Fig. 1 (left) shows the yield and ultimate strengths of 25 heats of HK31 from several foundries. All casting methods were used; section range was from 0.100-inch to 2 inches.*



Study showed that HK31 is not readily affected by section's size or casting method. Chart right shows that shear strength of sand cast HK-31A-T6 is over 65% of UTS at all temperatures.

PUZZLED .....

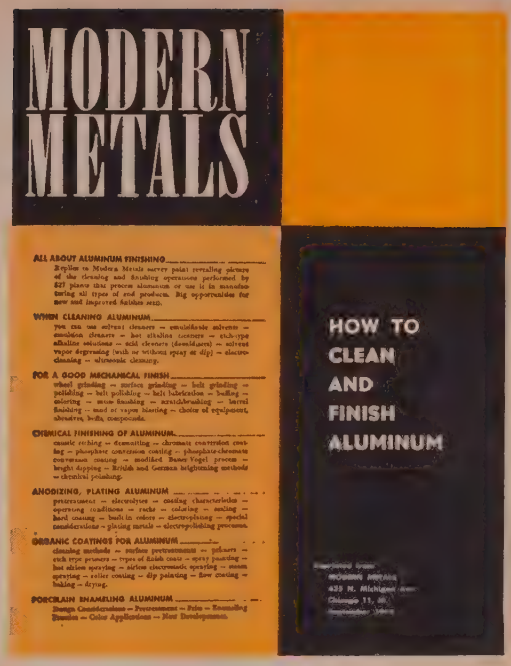
about cleaning or finishing aluminum ?

Find the answers in this 36 - PAGE REPRINT

All seven major editorial features from the September 1959 issue of Modern Metals have been brought together in one useful and interesting booklet (see table of contents below). To order copies, simply fill in order form below and return it, with payment, to Modern Metals, 435 N. Michigan Ave., Chicago 11.

PRICE LIST

Copies	Price per copy
1 to 5	$1.00
6 to 25	.75
Over 25	.50



ALL ABOUT ALUMINUM FINISHING

Replies to Modern Metals survey paint revealing picture of the cleaning and finishing operations performed by 327 plants that process aluminum or use it in manufacturing all types of end products. Big opportunities for new and improved finishes seen.

WHEN CLEANING ALUMINUM

you can use solvent cleaners — emulsifiable solvents — emulsion cleaners — hot alkaline cleaners — etch-type alkaline solutions — acid cleaners (deoxidizers) — solvent vapor degreasing (with or without spray or dip) — electrocleaning — ultrasonic cleaning.

FOR A GOOD MECHANICAL FINISH

wheel grinding — surface grinding — belt grinding — polishing — belt polishing — belt lubrication — buffing — coloring — satin finishing — scratchbrushing — barrel finishing — sand or vapor blasting — choice of equipment, abrasives, buffs, compounds.

CHEMICAL FINISHING OF ALUMINUM

caustic etching — desmutting — chromate conversion coating — phosphate conversion coating — phosphate-chromate conversion coating — modified Bauer-Vogel process — bright dipping — British and German brightening methods — chemical polishing.

ANODIZING, PLATING ALUMINUM

pretreatment — electrolytes — coating characteristics — operating conditions — racks — coloring — sealing — hard coating — built-in colors — electroplating — special considerations — plating metals — electroplating processes.

ORGANIC COATINGS FOR ALUMINUM

cleaning methods — surface pretreatments — primers — etch type primers — types of finish coats — spray painting — hot airless spraying — airless electrostatic spraying — steam spraying — roller coating — dip painting — flow coating — baking — drying.

PORCELAIN ENAMELING ALUMINUM

Design Considerations — Pretreatment — Frits — Enameling Practice — Color Applications — New Developments.

FINISHING REPRINT ORDER FORM

Fill in and mail, with payment, to Modern Metals, 1810 Tribune Tower, Chicago 11, Ill.

Send me _____ copies of the reprint, "How to Clean and Finish Aluminum." Payment of $_____ is enclosed.

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

MARCH

Figure 2

Cost Comparison Of Various Fabrication Methods - Magnesium Thorium Components

	COMPONENT A			COMPONENT B		COMPONENT C	
	Sand Cast	Extruded, Rolled & Flash Welded	Roll Ring Forged	Sand Cast	Die Forged	Sand Cast	Impact Extruded
As formed weight, pounds	19	31	49	39	40	96	118
Pattern or die cost, dollars	1525	1970	2120	2300	5220	2548	8800
Cost per part, dollars	212	207	250	304	472	612	750

Costs per part based on 25 piece quantity.

ment, although proper fixturing will eliminate this. Deformation during the aging cycle is very improbable.

Adherence to the recommended heat treat cycle is mandatory for bringing the HK31 alloy to the T6 condition. Deviations from the cycle will not remedy errors in composition.

HK31 is not readily affected by section size or casting method. Figure 1 shows the yield and ultimate strengths of 25 heats of material from several foundries, encompassing sections from 0.100-inch to 2 inches and all the casting methods referred to earlier. Selective plotting of these curves indicated no trends.

Values from permanent mold and investment castings were not higher than those from sand castings. Thin sections were not stronger or less ductile than heavy sections. Most significant, perhaps, all of these strength values — obtained for design purposes — were obtained on specimens cut from castings.

The wide differences between specification minimums for test bars compared with those for castings emphasize the need for realism and an awareness of the old axiom that the castings fly—not the test bars.

Among the other properties of HK31 which were evaluated during these studies, the most important was shear strength. Figure 1 gives the shear strength of HK31-T6 up to 900°F. The value is over 65% of the ultimate tensile strength at all temperatures.

Since many of the cast components in this engine had been fabricated by other methods in earlier engines, studies were conducted to compare costs. Figure 2 compares the cost of casting with other methods for three components of different configurations. The break-even points vary with each method, but are between 100 and 300 parts. Other components considered in the same manner showed casting to be the cheapest means of production for any quantity.

A part that was previously made as a sheet metal assembly is shown in Figure 3. Also shown is a cost breakdown comparing the two methods of production.

Needed: Thin Sections

As many of these components were previously made from sheet metal, some parts had section sizes no greater than 0.125-inch. The casting of these in sand was not considered practical at that time, and the permanent mold method was used successfully.

A typical part is shown in Figure 4. A shell core was used to give the internal configuration.

Many of these and other castings have been produced satisfactorily by the permanent mold method. More recently, similar parts have been cast in an assembly of baked cores and in a dry sand mold. By all these means, wall thicknesses down to 0.100-inch have been poured.

Chem Milling Helps, But . . .

Another technique for obtaining thin walls in HK31 castings is the chemical milling process. The attractive strength to weight ratio of cast HK31 cannot always be utilized fully if the casting process cannot produce walls as thin as desired. The machining of magnesium, though rapid compared with the machining of other metals, is frequently hampered by complex configurations. Chem milling offers an alternative means of obtaining thinner walls than may be cast.

For some time, the relative heterogeneity of cast alloys made chem milling impractical. Tolerances were difficult to hold; a rough, uneven surface resulted; and defects were uncovered.

First attempts to chem mill HK31-T6 castings were similarly discouraging. The final finish was worse than the original finish, whether machined or as cast. Worse yet, inclusions became apparent as black globules.

Surprisingly enough, they are not detrimental to tensile strength. Above 500°F, however, they reduce the ductility (these remarks apply to short time tests), and there is evidence that their effect on long time creep and fatigue is more serious.

Fortunately, the commercial chem milling of HK-31-T6 castings has been made practical by the development of etchants which do not evoke this oxide defect. Using the proper etchant, tolerances of plus or minus 0.002-inch may be held, uniform surfaces may be obtained, and a substantial improvement in surface finish can result.

As littls as 0.005-inch removal of metal can chemically polish the surface of

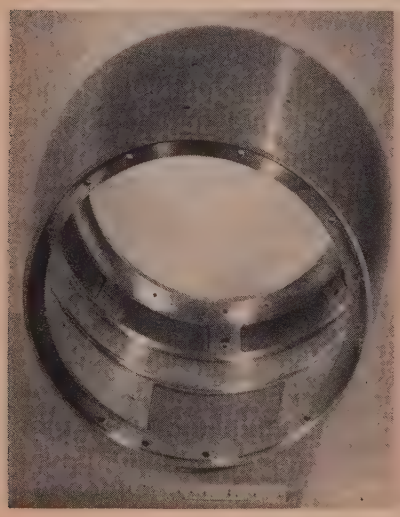


Figure 3

COST COMPARISON:

Sheet Metal Assembly vs. Sand Casting Magnesium Thorium Component

	Sheet Metal Assembly	Sand Casting
As formed wt., lbs.	11	39
Pattern or tooling cost, $	5500	2300
Cost per part, $	420	304

Costs per part based on 25-piece quantity.

■ ***Per part cost of the component shown at left was reduced 27% by going to casting. Internal panels were chem-milled to save weight.***

QUALITY SERVICE

of your specific alloy...

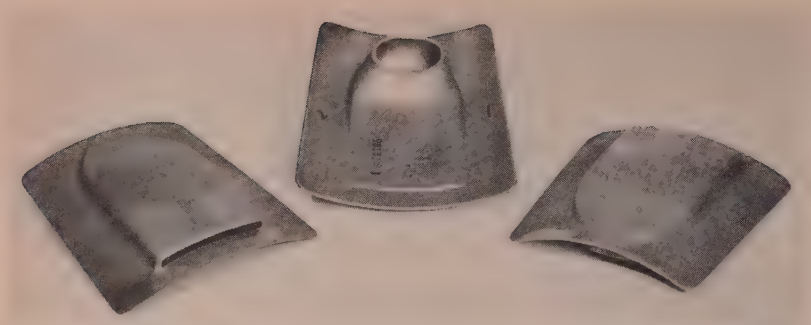
The modern A & M TRUCK FLEET insures rapid low cost delivery of your specific alloy. From the day you place your order, it is efficiently expedited by A & M personnel in order that you may meet your production schedules. Satisfied customers for over 20 years is the proof of quality alloy plus quality service.

Producers of Quality Aluminum Alloy Since 1938

ALUMINUM and MAGNESIUM, INC.

1 HURON STREET • P.O. BOX 720 • SANDUSKY, OHIO • TELEPHONE: MAin 6-4610

P.O. BOX 156 • Corona, California • Telephone: REdwood 7-2922



■ *Fig. 4. Typical component showing thin wall sections capable of being produced. A shell core was used to obtain the internal configuration. Wall thicknesses down to 0.100-inch have been poured at Marquardt.*

as-cast HK31 and improve its finish from RMS 250 to 70. A casting with chem milled panels for weight reduction purposes is shown in Figure 3.

Radiographic examination of early HK31 castings revealed sweeping black lines indicating heavy segregation in occasional castings. Such defects appeared vastly more disturbing than customarily encountered in light metal castings so they were investigated.

Spectrographic and metallographic examination of the material particles indicated that the segregation particles were higher in thorium and/or zirconium content and that the black lines were deficient in those elements. Segregation is not peculiar to HK31. It is found in other alloys, but its manifestation in HK31 is more disturbing because of the large differences in radiographic density involved.

As may readily be suspected, this defect was frequently identified with the condition encountered during the chem milling studies. Oxides of thorium and/or zirconium can be considered responsible for both conditions.

Some companies have established standards for this type of segregation, and associations of national standing are to do the same in the near future. Careful evaluation of this type of defect is essential so that castings which satisfy mechanical and chemical requirements are not rejected unnecessarily.

During the production of HK31 castings, this type of segregation may be eliminated or at least greatly minimized by proper foundry handling, pouring and gating techniques.

To Repair Weld It . . .

Critical areas of HK31 castings are never welded but non-critical areas may be repair welded. If the proper technique is employed, the salvaged casting may be expected to perform quite satisfactorily.

The repair welding of HK31 castings is best carried out in the as-cast condition so that heat treatment to the T6 temper may be performed on both weld and casting. The following procedure is recommended:

1. Thoroughly clean area to be welded.
2. Use either EZ33 or HK31 filler rod and inert gas process.
3. Preheat casting uniformly to 400°F in a furnace.
4. Remove casting from furnace and heat with welding torch to above 600°F.
5. Deposit filler rod as rapidly as possible.
6. Maintain post weld temperature with torch between 400° and 600°F.
7. Return casting to furnace and permit to cool with furnace to below 200°F.

HK31-T6 castings have very good pressure-tight characteristics—only slightly inferior to EZ33 which is generally considered the best magnesium alloy in this respect. Figure 5 shows one of many castings which are tested at pressures up to 2200 psi. Impregnation is not used on these castings as their service temperatures exceed the capabilities of the commercially available impregnating compounds.

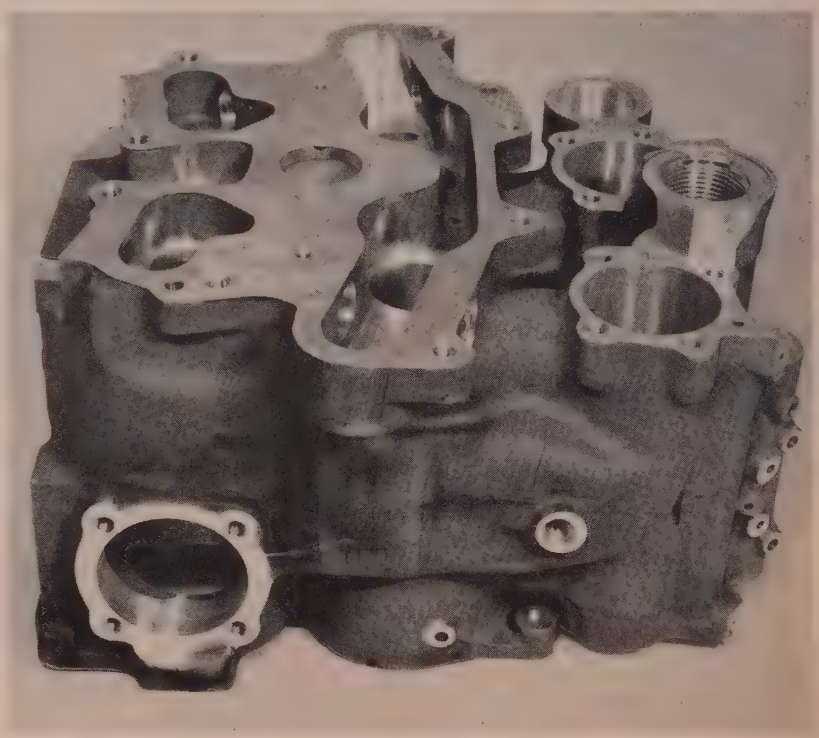
However, HK31 may be impregnated and tests are now being conducted with impregnating compounds which are said to be capable of withstanding temperatures up to 1000°F.

Inserts Save Threads

The joining of HK31-T6 castings is not different from methods used for other magnesium and aluminum castings, but effective fastening procedure continues to be a sadly neglected facet of light metal casting usage.

HK31 is sufficiently soft that repeated insertion and removal of bolts may easily damage threads. Vibration and the transmission of excessive loads can cause thread damage or distortion of the casting.

Several means of preventing these difficulties are available (see Figure 6) and all are variations on the theme of providing a harder lining for the threaded cavity. The use of inserts cast into place in HK31 castings has been con-



■ *Fig. 5. Castings such as the one shown and many others are tested at pressures up to 2200 psi, indicating that HK31-T6 castings have very good pressure-tight characteristics.*

Tenzaloy revolving chair base is a lightweight, high strength part that readily takes a desirable finish—anodizes clear white and takes a brilliant polish.

Sharp detail, brilliant finish, high strength castings:

TENZALOY

SELF-AGING ALUMINUM ALLOY

Tenzaloy, the aluminum alloy that needs no heat treatment, offers finished properties with great promise to the designer. Castability, even in complex shapes, is excellent. Castings are sharp, clean, take brilliant polish, anodize clear white, can be dyed all available colors, bright or pastel. Tenzaloy has great strength in thin cross sections, superior corrosion resistance, high dimensional stability. Investigate Tenzaloy for your new product. Write for Bulletin No. 103, or call Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, REctor 2-9500; or call your nearest Federated sales office.

ASARCO

AMERICAN SMELTING AND REFINING COMPANY

FEDERATED METALS DIVISION

Where to call for information:

ALTON, ILLINOIS
Alton: Howard 5-2511
St. Louis: Jackson 4-4040

BALTIMORE, MARYLAND
Orleans 5-2400

BIRMINGHAM, ALA.
Fairfax 2-1802

BOSTON 16, MASS.
Liberty 2-0797

CHICAGO, ILL. (WHITING)
Chicago: Essex 5-5000
Whiting: Whiting 826

CINCINNATI, OHIO
Cherry 1-1678

CLEVELAND, OHIO
Prospect 1-2175

DALLAS, TEXAS
Adams 5-5034

DETROIT 2, MICHIGAN
Trinity 1-5040

EL PASO, TEXAS
(Asarco Mercantile Co.)
3-1852

HOUSTON 29, TEXAS
Orchard 4-7611

LOS ANGELES 23, CALIF.
Angelus 8-4291

MILWAUKEE 10, WIS.
Hilltop 5-7430

MINNEAPOLIS, MINN.
Tuxedo 1-4109

NEWARK, NEW JERSEY
Newark: Mitchell 3-0500
New York: Digby 4-9460

PHILADELPHIA 3, PENNA.
Locust 7-5129

PITTSBURGH 24, PENNA.
Museum 2-2410

PORTLAND 9, OREGON
Capitol 7-1404

ROCHESTER 4, NEW YORK
Locust 5250

ST. LOUIS, MISSOURI
Jackson 4-4040

SALT LAKE CITY 1, UTAH
Empire 4-3601

SAN FRANCISCO 24, CALIF.
Atwater 2-3340

SEATTLE 4, WASHINGTON
Main 3-7160

WHITING, IND. (CHICAGO)
Whiting: Whiting 826
Chicago: Essex 5-5000

IN CANADA: Federated Metals Canada, Ltd.
Toronto, Ont., 1110 Birchmount Rd., Scarborough, Phone: Plymouth 73246

Montreal, P.Q., 1400 Norman St., Lachine, Phone: Melrose 7-3591

templated but not attempted. Such a method offers promise though it increases the foundry problems.

The principal difficulty with such joining methods is the contact of dissimilar metals. One safeguard against galvanic corrosion is to apply a chromate conversion coating to the tapped hole in the casting, paint the threads with zinc chromate primer, and install the insert while the primer is still wet.

Another method is to give the castings a light HAE finish. This has a negligible effect on thread dimensions and will effectively protect the magnesium. A third method is to dip the insert in an epoxy resin and install wet.

Stainless steel inserts should not be passivated. Passivated stainless steel is located further away from magnesium in the electro-chemical series than non-passivated stainless.

To Stop Corrosion

Corrosion of HK31 castings may be prevented by the use of Dow 17 or HAE. The HAE method gives better abrasion resistance. Where maximum protection is required and corrosion conditions are severe, an epoxy resin may be applied on top of these coatings, either of which serves as an excellent base for the epoxy.

The electroless nickel plating process on magnesium offers promise but has not yet achieved the status of reliability and reproducibility necessary for wide usage. Recent developments in vacuum deposition of metals suggest many intriguing applications.

Plate With Titanium?

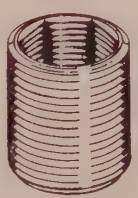
The plating of titanium on HK31 is being investigated as its properties of light weight, excellent corrosion characteristics, and suitability to the probable operating temperatures appear to be especially appropriate.

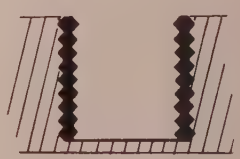
This paper has described the properties, costs, virtues and eccentricities of HK31-T6 castings strictly from the user's viewpoint. At Marquardt we are concerned with what can be done with these castings, the advantages and disadvantages involved in their use, and how they compare with other materials formed in the same and other ways. The production of such castings has no place in this paper and is a story for the foundry to tell.

The cast HK31 alloy has wide application in many other missile programs. Titan, Talos, Jupiter, Atlas, Polaris, Bomarc, Regulus, Minuteman, Hawk, Mace and Falcon missiles — all make use of this alloy's outstanding ability to perform at temperatures up to 900°F. And HK31 castings are now orbiting the earth in the Discoverer satellite, performing their required functions at colder than 300° below zero.

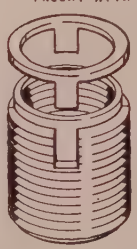
Figure 6 — Typical Inserts Used With HK31 Castings

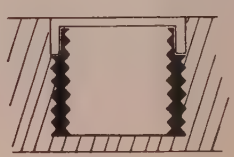
INSERT WITH INTERNAL AND EXTERNAL THREADS. INTERNAL THREAD IS BROACHED TO A HEXAGONAL SHAPE FOR EASE OF INSTALLATION. EXTERNAL THREAD HAS LARGER DIAMETER AT UPPER END, THEREBY GIVING A SELF-LOCKING FEATURE.



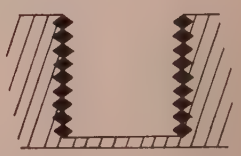


INSERT WITH INTERNAL AND EXTERNAL THREADS. LOOSENING OF INSERT IS PREVENTED BY A LOCKING RING IN A DOUBLE KEYWAY.





PRECISION-FORMED HELICAL COILS OF DIAMOND-SHAPED WIRE THAT FORM THE INTERNAL THREAD OF A TAPPED HOLE.



NOW!

Eliminate Non-Uniform Finish When Etching Aluminum

Microscopic corrosion has ruined the surface finish of many wrought or extruded aluminum parts. Its presence becomes apparent only after the part has been etched and the surface produced is non-uniform. In the past, when the etch was a final treatment this meant a poor appearance and if the part was to be anodized, the surface irregularities had to be removed mechanically and the part re-etched.

The problem now has been solved with the development of the CLEPO **Even-Etch** Process which cleans wrought or extruded aluminum, removes all micro- and macro-corrosion and imparts to the surface a smooth, silvery appearance. **Even-Etch** is used widely as a final finish on many household aluminum products. It is used to prepare aluminum for both anodizing and welding. It provides an excellent, slightly toothed surface for a paint base or for subsequent conversion coatings.

The CLEPO **Even-Etch** Process is a rapid and efficient means of etching aluminum without scaling the tank or steam pipes or forming heavy sludge. Irritating fumes are reduced and the acid burn hazards encountered with other methods are eliminated. **Even-Etch** has a long life expectancy and will reduce cleaning costs to a minimum.

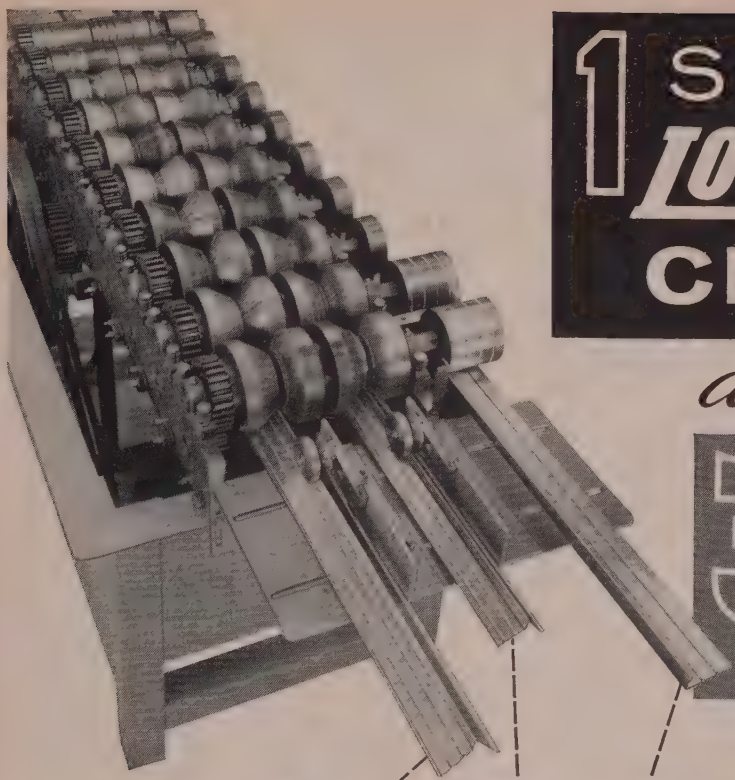
Write for complete information on the CLEPO Even-Etch Process.

FREDERICK

GUMM

CHEMICAL COMPANY INC.

538 Forest Street, Kearny, N. J.



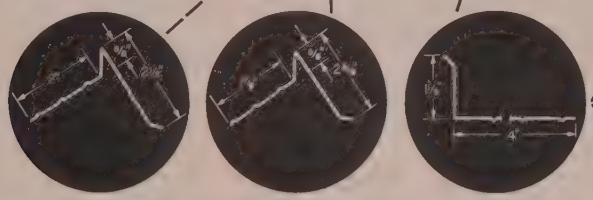
1 Standard LOCKFORMER CHASSIS

and

3 SETS OF Custom ROLLS

produce

THESE 3 PARTS



Material .023" galvanized

...another example of how you can equip your shop for custom roll forming at savings up to 75%!

When you order custom rolls on a *standard* Lockformer chassis, you by-pass the high development and engineering costs you normally expect with a special sheet metal forming machine. Thus, you get the equivalent of a custom designed machine at just a little more than the cost of a standard Lockformer.

What's more, standard low-cost parts will always be available for the *standard* Lockformer chassis. And the machine will never require special set-ups or special operator skills. Lockformers equipped for custom roll forming are as simple to operate, as easy and economical to maintain as standard Lockformers (the ones that have been making extra profits in thousands of shops for 30 years).

Why not send us a print and description of your next special forming job? We'll give you some exact figures on what you need and what you save in time and money by tooling up Lockformer style. No obligation. Ask for the new Lockformer Catalog, too.

LOCKFORMER
TIME SAVING, MONEY MAKING EQUIPMENT

manufactured by

THE LOCKFORMER COMPANY
Dept. MM, 4615 West Roosevelt Road
Chicago 50, Illinois

In Canada: Brown Boggs Foundry & Machine Co., Ltd., Hamilton, Ont.

Etched Capacitor Foil Output Boosted by Republic Foil

New plant is devoted exclusively to etching foil for electronic applications; culminates 11 years of costly research and development.

FORMAL opening this month of its new etching plant testifies to the steady gains of Republic Foil Inc. in its invasion of the capacitor foil market. The new plant, housing the company's Electrochemical Division, is located in Salisbury, N. C. It receives plain foil from the Rolling Mill Division at Danbury, Conn., and relieves Danbury of the etching operation entirely.

Of modest proportions now, the 15,000-square-foot building is equipped to produce up to $750,000 worth of etched 1199 alloy (99.99% pure) aluminum foil annually, according to John W. Douglas, president and founder of the company.

Pointing out that etched foil is sold by the square foot and that it would be difficult to establish production capacity in pounds, the Republic Foil executive estimated that the division could convert about 500,000 pounds of plain foil per year.

"Ample space and auxiliary facilities are presently available in the new plant to permit a substantial increase in this capacity promptly and at relatively little cost," Douglas explained. "By extending our plant in accordance with a prearranged design, expansion possibilities are almost limitless."

The new plant culminates Republic's 11 years of increasing pre-occupation with electronic uses of aluminum foil. Douglas had barely gotten the business on a paying basis when he launched a research program for development of rolling and processing techniques needed for capacitor foil production. Republic introduced its first capacitor foil in 1949.

"Electronic capacitors are essential components of radio, television, and all kinds of electronic equipment and power distribution systems," Douglas said. "Foil for this purpose averages from .00025-inch down to .00017-inch thick. Precision rolling and slitting machines are needed. It is by far the most difficult type of foil to produce."

The 1949 version of Republic's standard capacitor foil was in alloy 1145 and, according to Douglas, had cleaner edges and freer unwinding characteristics than other available capacitor foils.

"The product was an immediate success; in less than three years, Republic led this field," Douglas declared.

■ *New Republic Foil plant houses the Electrochemical Division, devoted solely to etching foil for electrolytic capacitors. Rolling Mill Division at Danbury has divested itself of the etching operation, will ship foil to Salisbury for this treatment.*

This didn't induce complacency, however. The company continued to search for other types of foil required in this market and in 1954 became interested in the rolling and etching of alloy 1199 foil, which is used in the manufacture of electrolytic capacitors.

"Electrolytic capacitors are used extensively in electronic circuits and in certain types of AC motors," Douglas said. "They require high purity foil anodes which generally must be etched to obtain the large effective surface necessary to store sufficient energy."

Domestic manufacturers of electrolytic capacitors had been etching 99.80% (alloy 1180) and 99.88% (alloy 1188) aluminum for a number of years, according to Douglas. He said that there has been a gradual increase in the use of 1199 foil during the past five years.

"A limited number of capacitor manufacturers have installed etching lines," he added, "but most producers have relied largely on imported etched 1199 foil because of the technical nature of the process and the high cost of the necessary etching equipment.

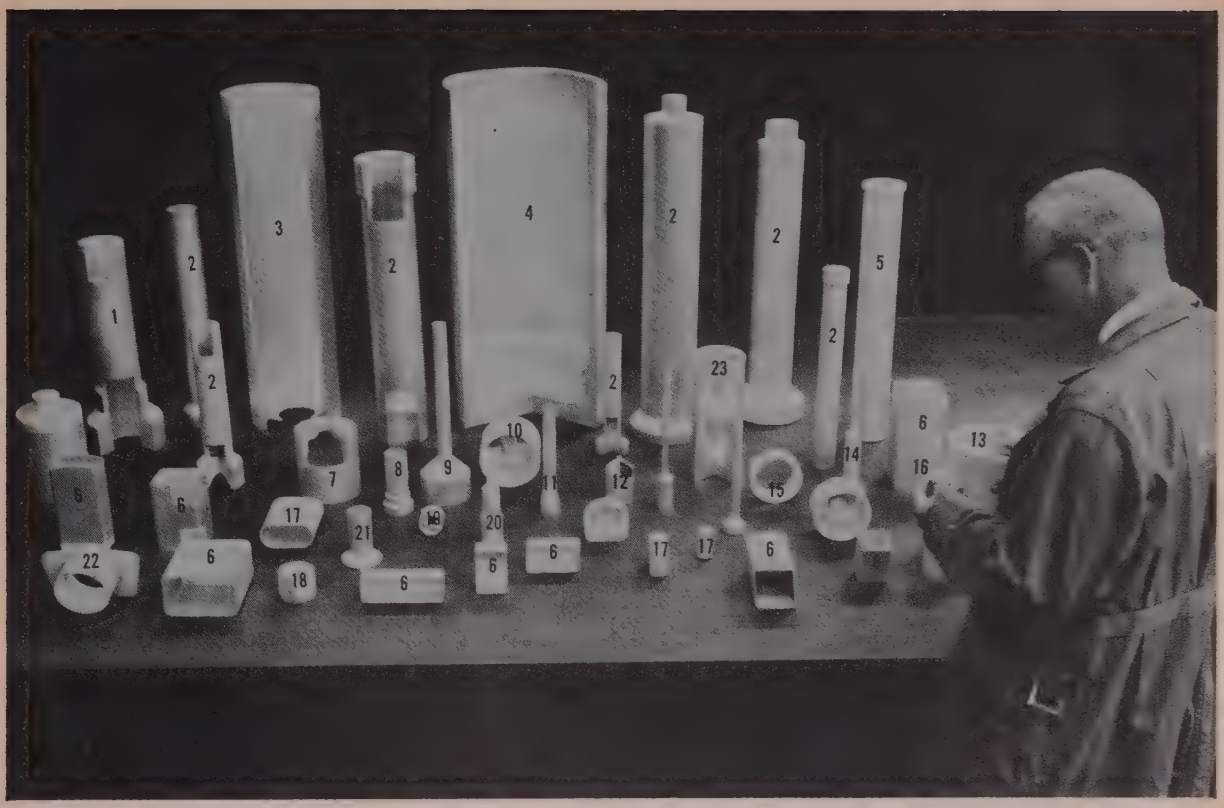
"In July 1955, Republic and a foreign manufacturer of 1199 etched foil entered into a contract under the terms of which Republic Etched Products, Inc. was formed for the purpose of etching 1199 aluminum foil for electrolytic types of capacitors."

Republic Etched Products put a pilot etching plant in production at Danbury as 1955 drew to a close. In June 1957, Republic Foil & Metal Mills (an earlier name of the company) acquired the interests of the other stockholders, dissolved the corporation, and set up the Etched Foil Division of the company.

Meanwhile Republic, the only aluminum foil producer to both roll and etch high purity aluminum foil commercially, continued to put large sums of money into research and development. Douglas described a 3-part program which has been carried on during the past four years.

"The first step consisted of development of complex techniques and installa-

(*Continued on page* 88)



IMPACT EXTRUSIONS... any type

...from Harvey Aluminum

Advantages of Impacts

- **Close Tolerances**
- **Low Unit Cost**
- **Smooth Surface**
- **Design Variations**
- **Material and Alloy Selection**

Typical examples where engineers, designers, and production managers found it economical to use Harvey Aluminum Impact Extrusions: 1. rocket motor orifice – 2. aircraft landing gear hydraulic members – 3. motor oxygen tank – 4. missile aft section – 5. distress light case – 6. aircraft structural fittings – 7. missile control gear case – 8. mechanical sleeve – 9. hydraulic pump shaft – 10. internal combustion piston – 11. rifle scope tube – 12. fractional horsepower motor cover – 13. jet motor cap – 14. pressure gage body – 15. propeller lock nut – 16. nut shell holder – 17. electronic control covers – 18. flexible tube coupling nut – 19. lawn mower motor pistons – 20. rocket fin housing – 21. rheostat control sleeve – 22. bulk head fitting – 23. oil gear housing.

For more information and technical assistance on impact extrusions, contact the nearest Harvey Aluminum factory branch listed under "Aluminum" in your classified directory, or write directly to the general offices of Harvey Aluminum, Torrance, Calif.

A major independent producer of quality aluminum in all alloys and sizes: Pig, ingot, billet, rod and bar, pipe, tube, hollow sections, press forgings, forging stock, hand forgings, impact extrusions, electrical bus bar, structurals, special shapes, light and heavy press extrusions, screw machine and other aluminum products. Similar products in titanium, zirconium, and steel. HARVEY ALUMINUM SALES, INC., Torrance, California.

HARVEY Aluminum

9 GOOD QUESTIONS ABOUT MACHINING ALUMINUM ALLOY 2011-T3 "MICRO-CHIP"

Here are answers Kaiser Aluminum Distributors have given to specific questions about machining the new 2011-T3 Micro-Chip. If you don't see the answer to your question here, ask your Kaiser Aluminum Distributor.

Q. **What does the new product—2011-T3 Micro-Chip Rod & Bar—offer in machining ability and other benefits?**

A. 2011-T3 Micro-Chip is easier to machine, and in most instances gives smaller, finer chips. It can speed production and increase tool life. It has a brighter, cleaner finish on unmachined parts and provides consistently excellent machining characteristics.

Q. **What is the recommended form tool feed when using a ½" width form tool on ¾" diameter 2011-T3 Micro-Chip?**

A. The form tool feed for average screw machine works is .0025 to .003. The faster feed eliminates or minimizes the rubbing action between tool and work.

Q. **In order to control diameters when forming on automatic screw machines, what is the best top rake angle for form tools when using 2011-T3 Micro-Chip?**

A. The top rake angle for form tools when using 2011-T3 Micro-Chip is 0 to 3 degrees. More top rake angle on form tools does promote free cutting, but some difficulty may be encountered in controlling diameters, and tool wear is greater.

Q. **Can threads be rolled on 2011-T3 Micro-Chip used in screw machine work?**

A. Yes. 2011-T3 Micro-Chip can be thread rolled.

Q. **Are chip breakers ever used when machining 2011-T3 Micro-Chip?**

A. Very seldom, unless forming a wide width such as 3 inches or more with exceptionally slow feeds. Sometimes the chip removed is similar to a ribbon and could cause interference with other tools.

Q. **Can 2011-T3 Micro-Chip aluminum alloy be color anodized?**

A. Yes. Numerous companies are color anodizing 2011-T3 Micro-Chip with consistently excellent results.

KAISER ALUMINUM DISTRIBUTORS— Your local source for specialized service!

ATLANTA METROPOLITAN AREA
Chase Brass & Copper Co.
Hubbell Metals, Inc.

BALTIMORE, MARYLAND
Chase Brass & Copper Co.
Hill-Chase Steel Co. of Maryland

BEAUMONT, TEXAS Standard Brass & Mfg. Co.

BIRMINGHAM, ALABAMA
U. S. Steel Supply Div.—United States Steel Corp.

BOSTON METROPOLITAN AREA
Chase Brass & Copper Co.
Hawkridge Bros. Co.
Zurbach Aluminum Co.

BUFFALO, NEW YORK
Ernst Iron Works Division

CHICAGO METROPOLITAN AREA
Chase Brass & Copper Co.
Fullerton Steel & Wire Co.
Korhumel Steel & Aluminum Co.
U. S. Steel Supply Div.—United States Steel Corp.

CINCINNATI, OHIO Chase Brass & Copper Co.
Morrison-Drabner Steel Co.

CLEVELAND, OHIO
Chase Brass & Copper Co.
Copper & Brass Sales, Inc.
Osco Steel Co.
U. S. Steel Supply Div.—United States Steel Corp.

DALLAS, TEXAS
Delta Metals, Inc. Earle M. Jorgensen Co.

DAYTON, OHIO Alloy Steels, Inc.

DENVER, COLORADO
ABC Metals Corp.

DETROIT, MICHIGAN
Alloy Steels, Inc.
Chase Brass & Copper Co.
Copper & Brass Sales, Inc.
Osco Steel Co.

ELKHART, INDIANA
Consolidated Metal Products Co.

GRAND RAPIDS, MICHIGAN
Copper & Brass Sales, Inc.

HIALEAH, FLORIDA Fullerton Metals Co.

HONOLULU, HAWAII
Honolulu Iron Works Permanente Cement Co.

HOUSTON, TEXAS Chase Brass & Copper Co.
Earle M. Jorgensen Co.
Standard Brass & Mfg. Co.

INDIANAPOLIS, INDIANA
Chase Brass & Copper Co.
Hubbell Metals Inc.
F. H. Langsenkamp Co.

KANSAS CITY, MISSOURI
Chase Brass & Copper Co. Hubbell Metals Inc.

LITTLE ROCK, ARKANSAS Delta Metals, Inc.

LOS ANGELES, CALIFORNIA
Chase Brass & Copper Co.
Eureka Metals Supply Co.
Earle M. Jorgensen Co.
Reliance Steel & Aluminum Co.
U. S. Steel Supply Div.—United States Steel Corp.

LOUISVILLE, KENTUCKY Hubbell Metals Inc.

MEMPHIS, TENNESSEE Hubbell Metals Inc.

MILWAUKEE, WISCONSIN
Chase Brass & Copper Co.
Fullerton Metals of Wis., Inc.
Lewis Steel & Aluminum Co., Inc.

MINNEAPOLIS, MINNESOTA
Chase Brass & Copper Co.
Fullerton Metals Co.
Korhumel Steel & Aluminum Co.

AND 9 GOOD ANSWERS BY KAISER ALUMINUM DISTRIBUTORS

Q. **How does the electrical conductivity of 2011-T3 Micro-Chip compare with that of free machining brass rod?**

A. The electrical conductivity % IACS for 2011-T3 Micro-Chip aluminum is 40. For free machining brass, 25.5.

Q. **What difference, if any, is there between 2011-T3 Micro-Chip and free machining brass in tensile and yield strengths?**

A. Alloy 2011-T3 Micro-Chip has a tensile strength of 55,000 and a yield strength of 43,000. Free machining brass has a tensile strength of 58,000 and a yield strength of 42,000.

Q. **What are the recommended surface feet per minute speeds when machining 2011-T3 Micro-Chip as compared to 2017-T451 and 2024-T351 alloys?**

A.

Material	*SFPM Round*	*SFPM Hexagonal*	*SFPM Square*
2011-T3	700-1100	450-550	300-350
2017-T451	450-550	350-400	250-300
2024-T351	450-550	350-400	250-300

AVAILABILITY OF 2011-T3 MICRO-CHIP ROD & BAR

Supplied as standard screw machine stock in specific 12-foot lengths, up to 3-inch diameter and 2-inch hex in standard 200-pound packages and specific 10-foot to 18-foot lengths for non-standard cold finished rod and bar and straightened wire with no length extra.

Chamfered *both ends* in diameters from ½-inch to and including 2-inch. Chamfered single end $\frac{3}{16}$-inch to and including $\frac{15}{32}$-inch. No chamfering over 2-inch diameter.

Color coded and ink imprinted.

Call your Kaiser Aluminum Distributor now for more information on Micro-Chip. See the listing below for the distributor nearest you.

KAISER ALUMINUM*

THE BRIGHT STAR OF METALS

*Trademark Kaiser Aluminum & Chemical Corporation

OMAHA, NEBRASKA Gate City Steel Co.

NEW YORK-NEWARK METROPOLITAN AREA
Chase Brass & Copper Co.
T. E. Conklin Brass & Copper Co., Inc.
A. R. Purdy Co., Inc.
U. S. Steel Supply Div.—United States Steel Corp.

NEW ORLEANS, LOUISIANA
Standard Brass & Mfg. Co.

PORT ARTHUR, TEXAS Standard Brass & Mfg. Co.

PORTLAND, OREGON
Eagle Metals, Inc. of Oregon
U. S. Steel Supply Div.—United States Steel Corp.

PHILADELPHIA, PENNSYLVANIA
Chase Brass & Copper Co.
Hill-Chase & Co., Inc.
U. S. Steel Supply Div.—United States Steel Corp.

PITTSBURGH, PENNSYLVANIA
William M. Orr Co., Inc.

PROVIDENCE, RHODE ISLAND
Chase Brass & Copper Co.

ROCHESTER, NEW YORK
Chase Brass & Copper Co.

SAN FRANCISCO-OAKLAND METROPOLITAN AREA
American Brass & Copper Co.
Chase Brass & Copper Co.
Gilmore Steel Corp.
Earle M. Jorgensen Co.
U. S. Steel Supply Div.—United States Steel Corp.

SEATTLE, WASH. Chase Brass & Copper Co.
Eagle Metals Co.
U. S. Steel Supply Div.—United States Steel Corp.

SHREVEPORT, LOUISIANA
Standard Brass & Mfg. Co.

SPOKANE, WASHINGTON Eagle Metals Co.

ST. PAUL, MINNESOTA
U. S. Steel Supply Div.—United States Steel Corp.

ST. LOUIS, MISSOURI Chase Brass & Copper Co.
Hubbell Metals Inc.
U. S. Steel Supply Div.—United States Steel Corp.

TAMPA, FLORIDA Fullerton Metals Co. of Tampa

TULSA, OKLAHOMA Earle M. Jorgensen Co.

WATERBURY, CONNECTICUT
Chase Brass & Copper Co. Hawkridge Bros. Co.

WICHITA, KANSAS General Metals Inc.

KAISER ALUMINUM INGOT DISTRIBUTORS

BENTON HARBOR, MICHIGAN
Michigan Standard Alloys Sales Co., Inc.

BUFFALO, NEW YORK
Samuel Greenfield Co., Inc.

CHICAGO, ILLINOIS
R. Lavin & Sons, Inc.

CLEVELAND, OHIO
Alloys & Chemicals Mfg. Co., Inc.

DETROIT, MICHIGAN
Alloys & Chemical Mfg. Co., Inc.

FAIRFIELD, ALABAMA
W. J. Bullock, Inc.

HOUSTON, TEXAS
Gulf Reduction Corp.

LOS ANGELES, CALIFORNIA
Aaron Ferer & Sons, Inc.

PHILADELPHIA, PENNSYLVANIA
George Sall Metal Co., Inc.

WEST SPRINGFIELD, MASSACHUSETTS
New England Smelting Works, Inc.

■ *John W. Douglas (left), president of Republic Foil Inc., Danbury, Conn., and North Carolina's Governor Luther H. Hodges look over photo of Republic's new plant in Salisbury, N. C. Plant was officially opened this month.*

tion of new equipment necessary to produce high purity plain foil having the rigid characteristics essential for production of etched foil," he said.

"The second phase involved the testing and adoption of improved etching methods and the operation of new equipment designed to give superior etching results.

Now Making 17 Types

"Finally," Douglas said, "there was the need to develop a number of types of etched foil for use in the manufacture of various types of electrolytic capacitors. In all, 17 different types of 1199 etched foil are now being made, consisting of anodic and cathodic material in various gauges, and for use at various working voltages."

By the late fall of 1958 Douglas and his associates determined that they had gathered enough technical information on the rolling and etching of foil and on the design of new equipment to warrant construction of a commercial plant.

"Not only is there a growing civilian demand for this material," Douglas explained, "but it is also of great military importance."

The large quantities of electric current required in the foil etching process dictated location of the plant in a low cost power area. After a thorough investigation of a number of properties in North and South Carolina, Republic Foil purchased 55 acres in Salisbury.

The building contains many original features and proprietary equipment designed solely for the production of this highly sensitive electronic product. The equipment consists of three etching lines having specially equipped tanks which take plain foil at one end and, after a closely controlled process, turn out etched foil at the other (see photo).

The tanks hold a current conducting solution to which large amounts of direct current are introduced to etch the surface of the metal, thereby increasing its area by as much as six times.

The speed of the metal varies from 90 to 180 feet per hour, depending upon the area gain desired. Special slitters and supplementary equipment are also used.

"We've long recognized that aluminum foil is a technical product and, in consequence, have paid particular attention to building a sound research and development department," Douglas said. "This unit has at its disposal a well equipped laboratory for testing foil, oils and other materials and for the development of new products."

The department is well staffed with engineers, chemists and technicians, and the laboratory is equipped to coordinate research with production control. Result is that the company can claim credit for the development of a number of technical foil products.

Early Experience Helped

In 1958, Republic introduced Electro-Dry, a registered proprietary name for a standard alloy capacitor foil having a reduced level of surface contamination. The following year, the company improved this product which, with two older Republic products—Silwynd and Slikwynd—gives capacitor manufacturers a choice of standard purity foils to suit a wide range of requirements.

"The experience and technical knowledge gained in the production of 1199 alloy foil permit us to roll and sell not only this alloy in unetched form but also alloys 1188 and 1180," Douglas said. "Thus, we offer to the capacitor trade a complete line of foils both of regular and high purity alloys and in etched and unetched conditions."

In mid-'59 Republic buttressed the sales operation by adding two engineers to the staff to serve customers' needs for technical information.

The Electrochemical Division is under the general supervision of William K. Hooper, vice president, who is headquartered in Danbury, Douglas said. Howard E. Walters, formerly Midwest sales manager, is plant manager, but sales will be guided by the sales department in Danbury.

The new plant and its equipment cost about $575,000, and was financed through the sale of 70,196 shares of the company's capital stock at $12.50 per share. The stock was listed on the American Stock Exchange last July. Earlier, the company's name was changed from Republic Foil & Metal Mills, Inc. to Republic Foil Inc.

Heightened activity in the Electrochemical Division has not meant that Republic's other foil markets have been neglected, however. The company has been working hard to develop superior converter foils for packaging, decorative and other uses.

"We've made great strides in the production of light gauge converter foils having free unwinding characteristics," Douglas said. "We were the first to introduce ultrasonically welded light gauge foil. And our high polish heavy foil for decorative applications continues in heavy demand."

Installing More Equipment

At the beginning of the year, the company's board of directors authorized the installation of a new high-speed, four-high rundown strip mill at Danbury, plus supplementary equipment and a plant addition. The mill will permit more efficient production of foil while boosting capacity.

Barring the financial headaches of its early career (MM, August, '56) Republic Foil Inc. has shown steady growth. Sales of the company increased from $2.8 million in 1954 to $4.3 million in '57. Although sales dipped in 1958—as was the case with so many businesses in that recession year—'59 sales set a new record. Net profit, Douglas said, will be substantially over that of 1958 when all the accounting is done.

"The company entered 1960 with a substantial backlog of unfilled orders, and the Rolling Mill Division is operating at peak capacity," Douglas said. "Notwithstanding highly competitive conditions from domestic and foreign sources, the sales outlook for 1960 is favorable and the production of high purity etched foil by the Electrochemical Division should add substantially to this volume."

■ *Republic Foil's testing laboratory tests etched foil to determine capacitance per unit area after laboratory forming.*

These actual photographs show a significant difference in drawn cups made from Aluminum Foils' Special "Non-Earing" quality material as compared with aluminum of regular quality.

The "ears" on the cups at left average four times higher than on the cups made of "non-earing" stock. In addition to having practically no "ears," the AFI Special "Non-Earing" material also shows no detrimental side splits.

Savings to the manufacturer are important: smaller blank size—less trim—less scrap.

Aluminum Foils, Inc., now produces Special "Non-Earing" quality aluminum not only in Alloy #3003, which is well known for its excellent drawing applications, but also in Alloy #1100.

For complete details call or write any of the seven offices listed.

ALUMINUM FOILS, INC.

JACKSON, TENN.

155 East 44th St.
New York, N. Y.

33 South Clark St.
Chicago, Ill.

Hanna Building
1422 Euclid Ave.
Cleveland, Ohio

Meadows Building
North Central Exp.
Dallas, Texas

Box 325
La Habra, Calif.

2962 Grandview
Atlanta, Ga.

WANT NEW BUSINESS?

Lots of new business from light metals fabricators and product manufacturers is obtained through half-column advertisements like this one.

And the cost is sure low —only $70 per insertion on an annual basis.

Want details? Write Dick Pulliam, Modern Metals, Tribune Tower, Chicago 11, DE 7-0638.

METALLURGIST
Wanted

Progressive nationwide metal fabricating concern has an excellent opening for an experienced metallurgist at one of their eastern divisions.

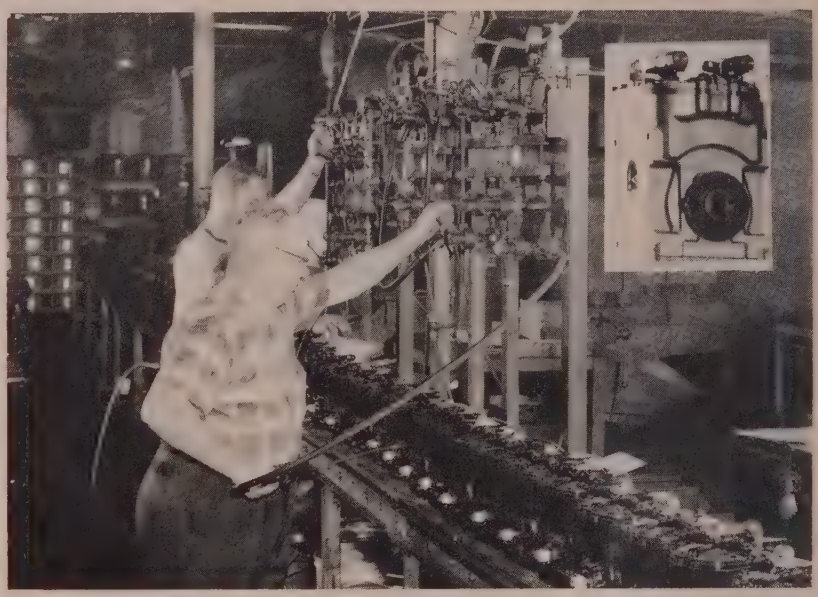
Non-ferrous background preferred but not absolutely essential. Should have some experience in metal production processes and mill problems. Salary open.

Please send complete resume to

Box No. 1277

MODERN METALS
435 N. Michigan Ave., Chicago 11, Ill.

News Products and People



Aluminum a Factor in Cheaper Auto Air Conditioners

Air conditioners are still a rather costly "extra" in the over-all cost of autos, but manufacturers have been able to reduce their prices substantially, according to Aluminum Co. of America, most actively interested of the aluminum producers.

Car units, which a few years ago averaged $450 installed and could add as much as $700 to auto price tags, now are available at prices averaging $350 or less, Alcoa reports.

The use of aluminum in the heat exchangers and in the compressor is a big factor in the price reduction, Alcoa development engineers say.

Aluminum easily lends itself to production casting methods, and is machined with much greater ease than iron. Alcoa proved the light metal would perform well at the high temperatures (up to 400°F.) and in the extreme pressures generated in the compact compressor unit.

A typical cast iron and steel compressor weighs 51 pounds. By utilizing aluminum castings in pistons, connecting rods, cylinder heads, crankcases, and motor mounts, this weight is cut by about half. Total aluminum usage amounts to 11 pounds per unit. In the accompanying photo, compressors are being given air pressure test, the final step before the units are packaged for shipment. Inset shows an unpainted aluminum compressor.

A Tecumseh Products spokesman said that the compressor is capable of speeds up to 6000 r.p.m., and has passed life tests of tens of thousands of miles.

"Factory installations of air-conditioners in autos is definitely on the upswing," he said. "In 1957 they were 3.5% of total auto production; in 1958, 4.5%. Installations in 1959 should turn out to be 6% of auto production."

Dual-Head Metal Polisher Developed

A dual-head polisher has been developed by Timesaver Sanders, Minneapolis 22, Minn. Incorporating a wide abrasive belt head and a 3M Scotch-Brite wheel, the unit can be used for polishing metal sheets, flat stampings or extrusions and strip stock.

A continuous conveyor belt carries material under both heads. The abrasive belt sanding head can be adjusted to fine tolerances to control stock removal. The forward-mounted belt removes scratches and scars on the metal's surface while the rear head polishes.

The unit has hydraulic adjustments for pressure and is fully automatic. A provision for oscillating the polishing head prevents marking of work.

Timesaver makes units with 12 and 18-inch widths.

Nonferrous Riser Sleeve Improves Castings

A newly developed riser sleeve for nonferrous castings offers more than twice the insulating value of conventional sleeves, says its producer, Johns-Manville, New York. As a result, Ris-A-Sleeve gives sound, economical castings of aluminum, brass, and bronze, while reducing rejects, says the firm.

The product reduces transfer of heat from molten riser metal, thus assuring that the riser will be the last casting metal to freeze, and aids uniform feedback from the risers to every corner of the mold. The new sleeve will not contaminate sand, and can be used for a blind riser. Its low rate of heat transfer allows use of small risers, increasing number of castings produced per melt.

Formulated from expanded silica and a binder, the sleeve offers a thermal diffusivity of approximately 0.04, transverse strength of 40 psi, and a linear shrinkage, moist to dry, of .011-inch per 8-inch length. It can be cut and shaped and has a density of 9 pounds per cubic foot.

Ris-A-Sleeve comes in five inside diameters, ranging from 1-5/16 to 4½ inches, and lengths from 4 to 8 inches. Wall thickness in all sizes is slightly in excess of 1-inch.

Pepsi to Move in Improved Shipping Cases

Pepsi-Cola bottlers in four cities have adopted a new lightweight carrying case. The case will soon be available to more than 500 Pepsi bottlers in the U. S. and abroad, according to Reynolds Metals Co. Reynolds, Pepsi-Cola Co. and Firestone Steel Products Co., Akron, Ohio, fabricator of steel and aluminum products, collaborated in development of the case.

So far, more than 26,000 of the aluminum cases are in use, according to Mario Di Federico, president of Firestone Steel, whose company makes and sells the cases. He anticipates rapid acceptance of the case which is intended for convenient handling of Pepsi between bottler and retailer. The photo shows that the case is designed to take 6-pack cartons of the soft drink. The cases can be stacked one on top of the other in stores and because they have cut-away sides which reveal the name imprinted on the cartons, will offer maximum product identification.

David P. Reynolds, executive vice president of Reynolds Metals Co., said that the new case is the first use of aluminum extrusions for a product of this type. Two identical extruded pieces are formed and riveted together to make the body of the case. A groove in the extrusions takes a masonite floor which holds the body square.

Reynolds pointed out that the new case will be easier to clean and maintain because aluminum will not rust or rot. Besides, it's 12% lighter in weight than the usual wooden case.

New Hinge Design Uses Embossed Aluminum

A new aluminum embossed hinge has been added to the hardware line of Lake Park Metal Stampings Inc., Youngstown, Ohio.

The hinge leaf which mounts on the door stile is continuously embossed to bridge the gap on the door edge, and support screws. The leaf also has guide slots to help alignment.

A wider leaf is mounted on a Z-bar. This forms a natural seat against the stop and provides automatic clearance for the door stile. Standard lengths are 81, 84, 87, 90 and 96 inches, with overall widths of 2 and 2-3/16 inches.

ARE YOU LOOKING IN THE RIGHT DIRECTION FOR *ALUMINUM* TUBING & PIPE?

MURRAY has it with substantial inventories and a wide range, both drawn and extruded.

If you have aluminum problems perhaps our specialists can help you.

If you need aluminum tubing, pipe, or fittings, call **MURRAY** Tubing Specialists For Over 115 Years.

Write for free 28-page Tubing and Pipe Stock List published bi-monthly.

A B MURRAY CO INC
ESTABLISHED 1845
NEW YORK PHILADELPHIA PITTSBURGH

A. B. MURRAY COMPANY, INC.
P. O. Box 654, Elizabeth, New Jersey
Name _____ Title _____
Address _____
City _____ State _____

Aluminum Sleeper Material for Rocket Motor Cases

Aluminum has demonstrated far better properties as motor case material for solid propellant rockets than was originally conceded by rocket men. A year-long research program conducted by Aluminum Co. of America showed that all-aluminum cases have yield strengths greater than steels generally considered for the application.

Over-all result, according to Alcoa, will be aluminum cases (pictured) strong enough to withstand pressures generated by powerful rocket engines required for new missiles and fantastic space vehicles.

Early in the program, hydrostatic testing of light metal cases in 7178-T6 — highest strength commercial aluminum alloy — exhibited yield strengths equivalent on a weight basis to 224,000 psi in steel. This surpasses the top yield strength of 200,000 psi available commercially in steel.

The one-piece aluminum cases were fabricated by a combination of forging, extruding, sizing and machining developed by Alcoa. Improvements in the process, plus new high strength aluminum alloys now being evaluated, are

expected to produce rocket motor cases with yield strength equivalent to 255,000 psi in steel.

This will be more than sufficient to meet stringent requirements (equivalent yield strength in the range 210,000 — 240,000 psi) for rocket engines now being developed. Such weapons as the underwater-launched Polaris and the all-purpose Minuteman will be driven by thrust from rocket motors fueled by solid propellants.

Aluminum's remarkable performance can be attributed to its strength to weight ratio — bench mark for judging a metal's merit for rocket motor casings — which is far higher than that of any other practicable material.

"The most significant fact revealed by the development program," according to W. C. Woodward, Alcoa's manager of aircraft and missile sales, "has been the complete absence of premature bursting. During testing, each case has shown large volumetric expansion — up to 5%. This is an excellent indication of the reliability of aluminum cases. Testing has been limited, but highly successful, and we feel certain that aluminum cases soon will be classed as production items."

In another approach to the problem, Alcoa has fabricated cases wrapped with fine, high strength wire.

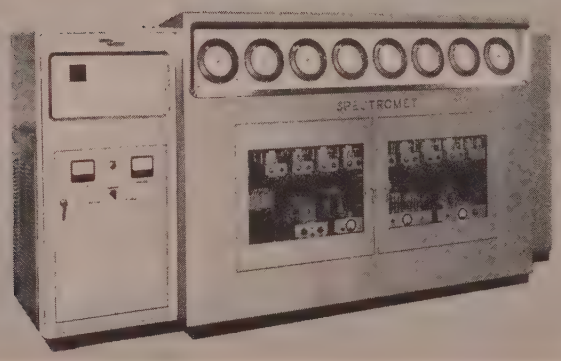
Paint Remover Safe For Metal Products

Beck Equipment Co., Cleveland, has developed a stripping fluid which removes difficult finishes without damaging the metal product. Epoxystrip NC-194 will not corrode magnesium, steel, aluminum, brass or any combinations of these metals.

Epoxies, polyurethanes and the new acrylics as well as conventional paints, lacquers and enamels can be removed with the new product. After application the finish swells, pops loose and is flushed away with water. The metal surface, when dry, is ready for refinishing.

Aluminum Products Manufacturer Eliminates "Off-Analysis" Heats with

Spectromet ®



Adams Engineering Company, Inc., Miami, Fla., realizes 8,000 bonus pounds of perfect alloy each month through on-the-spot analyses of molten aluminum samples used in its ABC window and furniture lines. Simultaneous analysis of up to eight elements with the Baird-Atomic Spectromet permits accurate control of each heat before casting. In addition, Adams Engineering can now process perfect alloy from "mixed" aluminum scrap which is 50% less in cost than the former basic material.

The capability of the B-A Spectromet to perform accurately under foundry conditions with high precision makes the instrument invaluable in quality control analyses. The Spectromet's exclusive Automatic Servo Monitor* mechanism maintains correct optical alignment under all operating conditions.

*Patent Applied For

For complete details on the Spectromet write to:

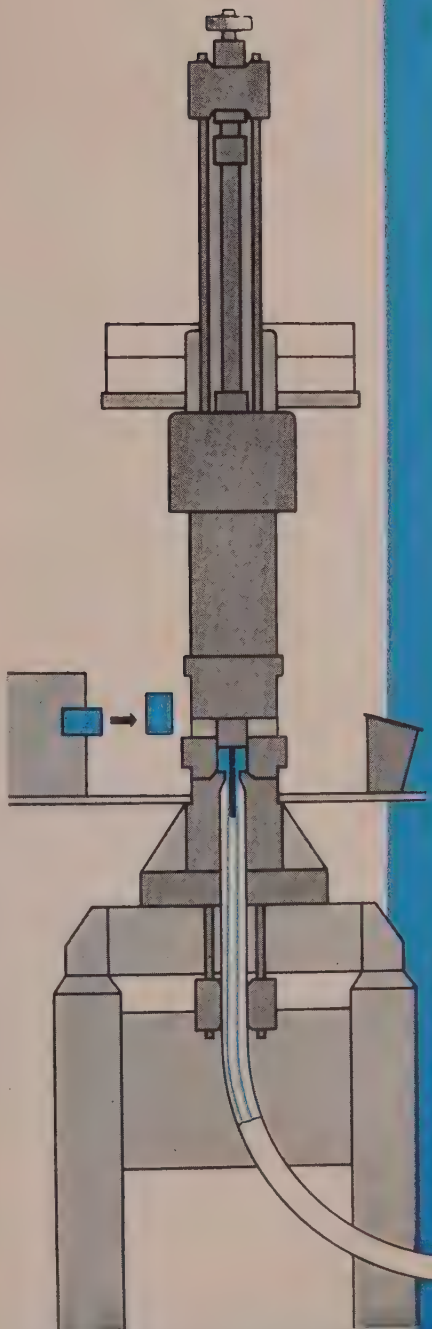
Baird-Atomic, Inc.

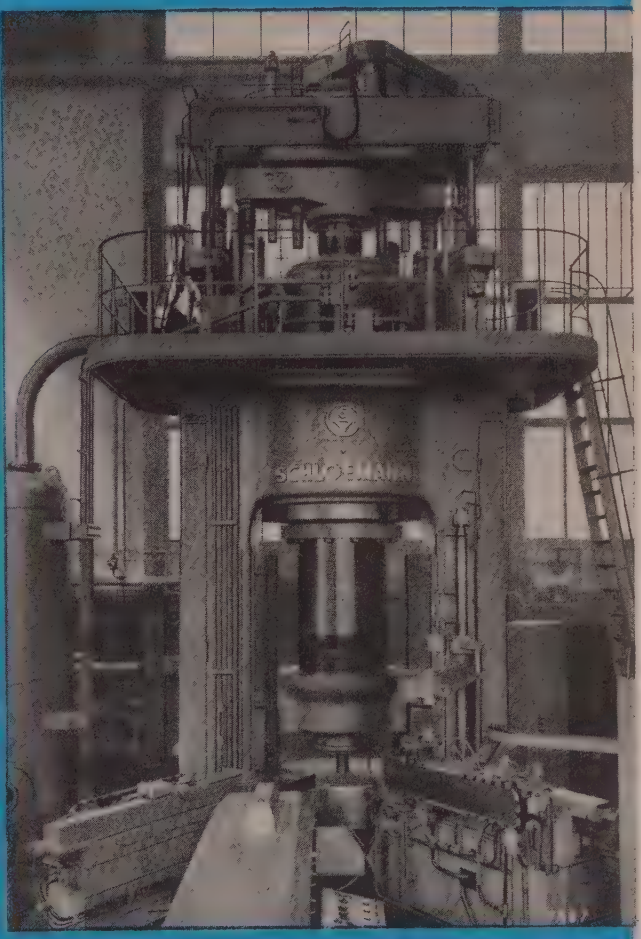
33 UNIVERSITY RD., CAMBRIDGE 38, MASS.

Baird Atomic

SCHLOEMANN

Extrusion Presses Automated





The fully automatic operating cycle of this vertical 7,375-ton tube and rod extrusion press also includes billet charging, loading and removing the dummy, as well as the converging block; severing the butt, cutting and stacking the extruded product; cooling mandrel, container, and die. Essential features of the press are covered by patents. Only one operator required. 21 vertical SCHLOEMANN extrusion presses equipped for manual or electro-hydraulic automatic control have been built within the past nine years. Latest SCHLOEMANN horizontal extrusion presses also feature fully automatic operating cycle.

FELLER ENGINEERING COMPANY 1165 Empire Building, Pittsburgh 22, Pa.

HOT AND COLD ROLLING MILLS • COUNTERBLOW HAMMERS • HYDRAULIC PRESSES

Aluminum Duct Helps Cool Signal Oil Building

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., supplied 90,000 pounds of aluminum duct sheet for the 434-ton air conditioning system in the new Signal Oil building, Los Angeles.

Aluminum's light weight and ductility were the principal advantages in installation, but even more important is the fact that heat loss and air resistance are reduced with the light metal system. Some 160,000 cfm of circulating air will be carried in the duct.

Firm Licensed to Draw T-Metal Wire, Rods

Seymour Mfg. Co., Seymour, Conn., has been exclusively licensed by Hydrometals Inc. to manufacture wire from Hydro-T-Metal, an alloy of zinc, titanium and copper.

Seymour will work with the Hydro division, Illinois Zinc Co., and the Dow Chemical Co. Its Dow Metal Products Div'n will supply metal in heavy cast bars which Seymour will draw and roll into wire and small diameter rods.

Fred M. Zeder, II, president of Hydro, says T-metal is the first zinc-based alloy that is stretch or sag resistant when under tension or when exposed to temperature changes. He also said the metal will not rust, stain or discolor adjoining materials.

G. T. Underhill, vice president of sales for Seymour, says the metal can be used for zippers and jewelry, in heavy industry for screws, rivets, etc., and in the building and electrical industries.

Half of New Gas Turbine Made of Aluminum Alloys

A medium horsepower, gas turbine engine, half of which is made of aluminum alloys, has been developed by Williams Research Corp., Walled Lake, Mich. Prototypes of the engine have been ordered by several manufacturers, and the government thinks the unit may have marine and stationary power uses.

A unique factor of the engine, according to Sam Williams, president of the firm, is its heat exchanger. It reintroduces exhaust heat into the engine to make more efficient use of fuel. The final exhaust is cool enough to touch with the bare hand, he says. Also important is that the whine usually connected with turbines is reduced by baffled air intakes.

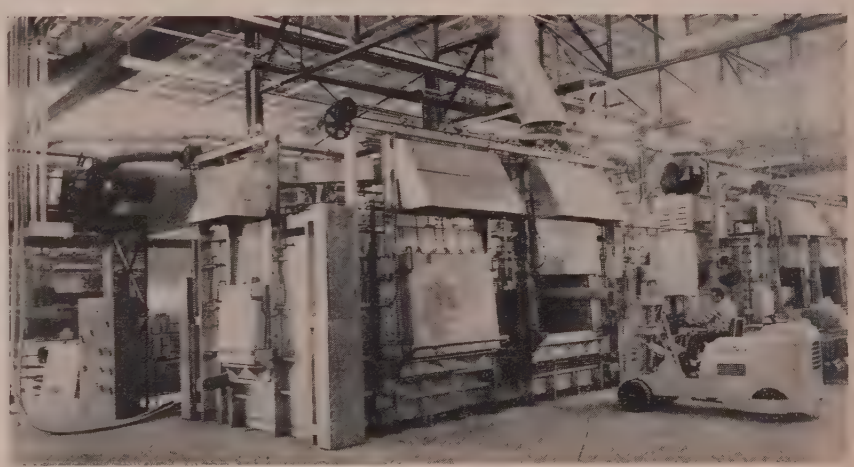
A 75 h.p. marine prototype has been tested in a boat on the Detroit River for more than a year. It runs at 58,500 rpm, normally, but has reached 61,000 rpm. The power output shaft spins at 5000 rpm. The engine weighs approximately one pound per horsepower.

Plans to manufacture an aircraft version are being made while patents are pending for the unit and its components. Other arrangements, to license manufacturers that may want the engine for other uses, are in progress.

In addition to the claims made for the turbine, Williams says manufacturing methods patterned by the firm will allow mass production of the units at a lower cost per horsepower than current piston engines.

Unmatched for Melting Aluminum...

ROCKWELL FURNACES



At Mirro Aluminum Company's new plant in Manitowoc, Wisc., the very first mill operation was entrusted to these two large Rockwell reverberatory furnaces. 45,000 lbs. of aluminum pig, scrap and alloy materials are melted down, and 20,000 to 24,000 lbs. drawn off and transferred to Rockwell holding furnaces, whence the metal is tapped for casting into 12 ft. long ingots. The process is under controlled atmosphere and temperature conditions.

Farther down the production line, 4 large Rockwell car type coil annealing furnaces have just been installed.

Leading producers and fabricators of light metals know the performance value of Rockwell furnaces and ovens from melting through reheating, homogenizing and annealing to exacting specifications. Get Bulletin 128.

What are your needs?

W. S. ROCKWELL COMPANY
2060 Eliot Street • Fairfield, Conn.

ALUMINUM? WHO'S GOT IT?

The man from Jorgensen has. Sheet, plate, rod, bar, tubing, structurals and extrusions...all Jorgensen service centers carry them in the sizes and alloys you need.

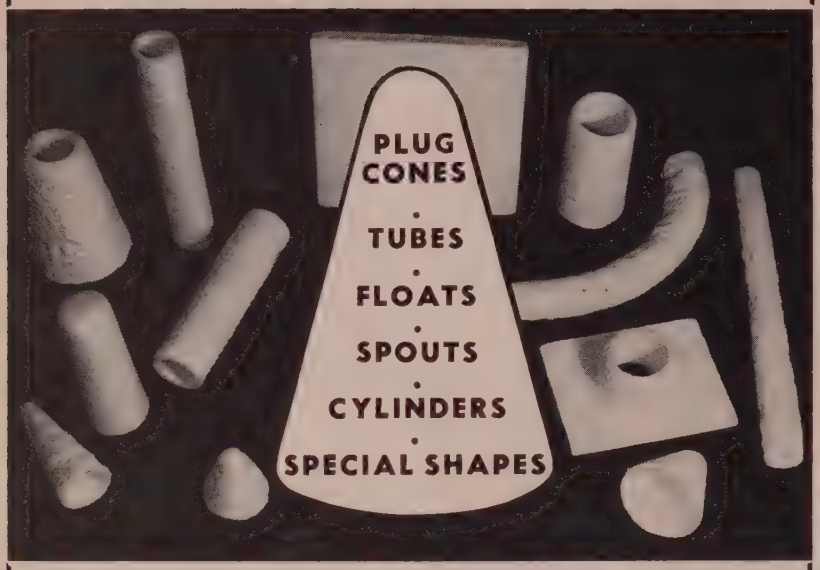
Jorgensen also offers extensive cutting facilities as well as an expert staff of metallurgists ready to aid you in selection and processing problems. And Jorgensen's own truck fleet means fast delivery.

Next time...this time...
whenever you need aluminum...call Jorgensen first! **EARLE M. JORGENSEN CO.**

LOS ANGELES • SAN DIEGO • PHOENIX • OAKLAND • SAN FRANCISCO • SEATTLE • HOUSTON • DALLAS • TULSA • DENVER • WICHITA

distributors of KAISER ALUMINUM

WRP®-X REFRACTORY...



Cones to fit Tap Hole Plugs in aluminum melting furnaces — resilient — labor saving — economical — give a positive seal — cleaner melting. WRP®-X products not wet by molten aluminum withstand in excess of 2000° F. *Send for new brochure.*

REFRACTORY PRODUCTS CO.

910 CUSTER AVENUE (GReenleaf 5-8938) EVANSTON, ILLINOIS

FROM SUPERIOR DIES, superior extrusions

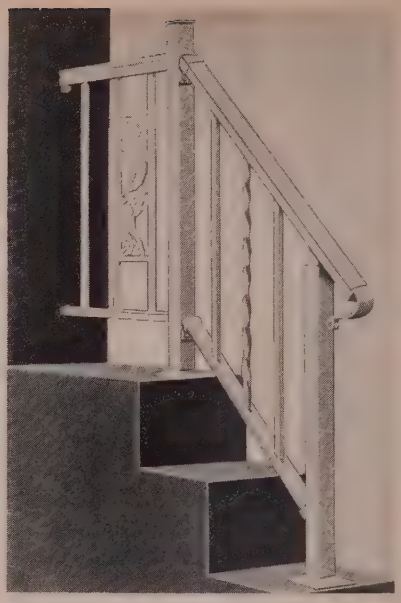
15 years of die-making "know-how" is tooled into every die . . . your assurance of highest-level production, lower cost and *fastest deliveries!* For complete die satisfaction, call SUPERIOR.

Aluminum Sections by General Extrusions, Inc. from Superior Dies

SUPERIOR EXTRUSION TOOL & DIE COMPANY

MICHAEL SUSKO, *President* • HENRY MARSILIO, *Sales Manager*

56 S. Meridian Rd., Youngstown 9, Ohio • Phone: SW 9-6273



Railing Line Given Dual Feature

Railings and bannisters made by Superior Aluminum Products, Inc., 2563 Wilson Ave., Youngstown, Ohio, now feature a "swivel action" which makes them self adjusting for steps. The railings are made in lengths from 3 to 12 feet in straight or step railings, ready to install, or in a lineal package with all accessories included to make railings of numerous styles and designs.

Superior's railing products are satin anodized. Matching scrolls and patio columns are made with single or double scrolls. Cast rose and oak leaf inserts are an optional feature of the line.

Titanium Industry Shows Some Recovery

Except for output of sponge metal, all phases of the titanium industry took significant recovery strides last year, according to the Bureau of Mines, U. S. Department of Interior. Production and consumption of titanium ingot and output of mill products jumped 15%, while sponge output dropped 17%.

In 1958, 4600 tons of sponge was produced, but during the year the government stopped purchases of the metal. This was reflected in last year's production, which dipped to 3900 tons, and consumption which totalled 3800 tons.

Ingot production topped '58 by 420 tons, but consumption jumped 829 tons. Output of mill products climbed from 2594 tons to 3000. Indications are that the year could have been better, since activity in all segments of the industry declined 50 to 75% during the steel strike, according to the Bureau.

Mallory-Sharon Metals Corp. entered

into an agreement with Bridgeport Brass Co. whereby the latter's experience, fabricating facilities, commercial organization and management resources were made available to Mallory-Sharon. In exchange, Bridgeport was given an option to purchase an equal interest in Mallory-Sharon with P. R. Mallory & Co., Inc., Sharon Steel Corp., and National Distillers and Chemical Corp.

On the world scene, Japan produced 2000 tons of titanium metal last year and England 1700 tons. During the first 11 months imports of titanium from Japan totaled 1412 — 14% less than totals for the similar 1958 period.

Prices of sponge metal and mill products dropped during the year. Grade A-1 sponge was selling for $1.62 to $1.82 per pound in January, but dropped to $1.60 by September. Grade A-2 cost $1.70 in January, and $1.50 in September.

Mill products showed a steady price decline as follows:

	January	December
Sheet	$9.10-9.60	$7.75-8.50
Strip	8.50-9.00	7.25-8.00
Plate	6.00-6.75	5.25-6.00
Wire	6.50-7.00	5.55-6.05
Forging billets	3.80-4.35	3.20-3.70
Hot-rolled bars	5.10-5.50	4.00-4.50

Hydro-Air Craft to be Unveiled

Spacetronics Inc., Washington, is readying for unveiling a full-size hydro-air cargo-carrying craft intended to streak across water while magically floating on a cushion of air.

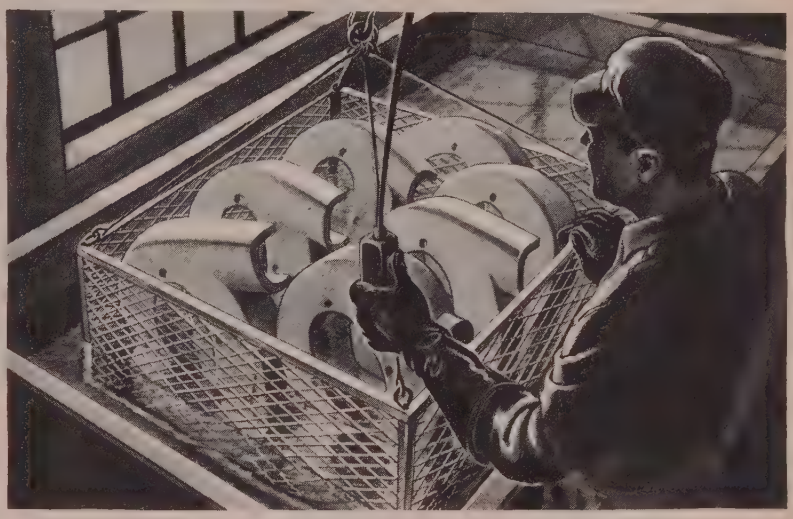
Originated and developed by Spacetronics engineers, the unusual machine is being built of aluminum extrusions and sheet. The light metal shell is packed with styrofoam to provide buoyancy and additional strength.

When completed, the tear-shaped vehicle will be 32 feet long, 24 feet across at the widest point, and two feet high. The horizontally rotating, specially designed propeller shown above will be housed in the bow of the craft.

To prevent corrosion and anchor paint on aluminum

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 SERVICE MEN • OVER 160 MATERIALS



Protect aluminum at lowest unit cost with CHROMICOAT conversion coatings

Oakite CHROMICOAT is an economy any way you look at it: on the basis of price alone . . . on solution make-up and "mileage"... on the way it blocks corrosion and forms a perfect anchor for paint to keep your customers sold and satisfied.

This is a conversion coating you can depend on. Oakite ChromiCoat protects for hundreds of hours under the ordeal of salt-spray tests . . . and surpasses MIL-C-5541 specs *several times over!*

And the Oakite process is simplicity itself. No control problem. A thin, golden, uniform coating every time.

ChromiCoat is just one of a line of more than 30 Oakite materials designed especially for aluminum. There are etch and non-etch cleaners . . . barrel finishing compounds . . . safe paint strippers . . . forming lubricants.

For more information, ask your local Oakite man or write to Oakite Products, Inc., 45B Rector Street, New York 6, N. Y.

it PAYS to ask Oakite

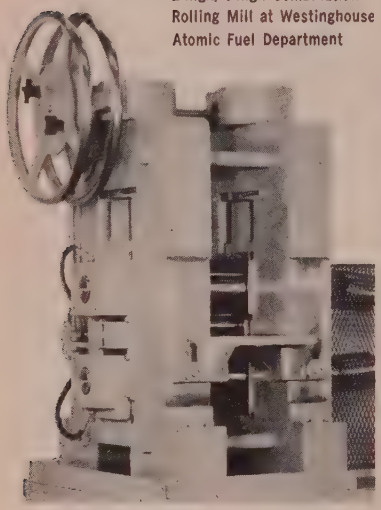
OAKITE

over 50 Est. 1909 SCIENCE

years' leadership in industrial cleaning

LOMA

1½" & 6" x 8" Heavy Duty 2-high/4-high Combination Rolling Mill at Westinghouse Atomic Fuel Department



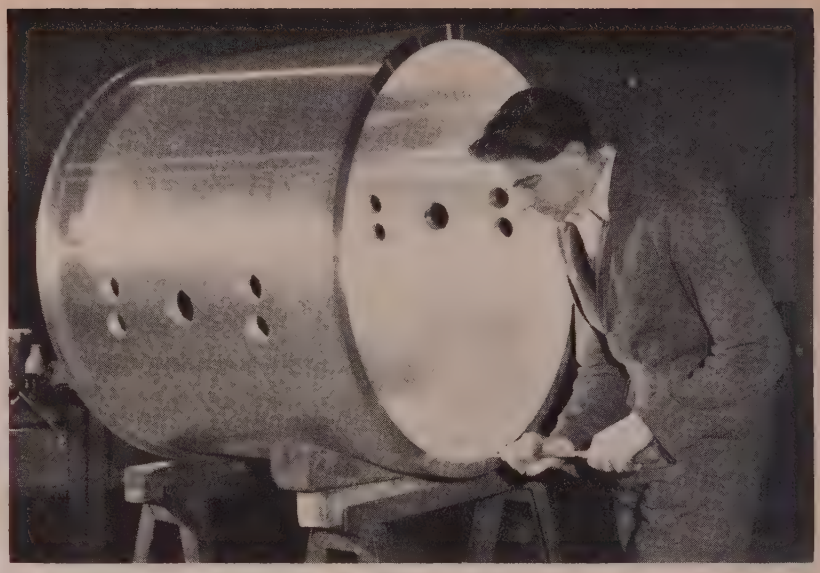
need special metal processing machinery?

Whether it's continuous casting of non-ferrous alloys; sawing of billets, slabs, rods, tubes and other sections; rolling of sheet, strip or shapes; and straightening of extrusions or flat stock; chances are you'll find the answer to your mechanical and metallurgical processing problems at LOMA. Our experienced engineering organization and manufacturing plant specializes in the construction of custom-built metal processing equipment. Our machinery can be made for manual or automatic operation, with direct or remote control, in single units or integrated facilities for laboratory or high production application.

Our standard line of equipment includes:

- Casting Machines and Molds
- Saws and Cut-off Machinery
- Hot and Cold Rolling Mills
- Rod and Tube Draw Benches
- Roller and Stretcher Levellers
- Air and Hydraulic Tube Testers

LOMA
MACHINE MFG. CO., INC.
114 East 32nd Street
New York 16, N. Y.



Aluminum-Tin Alloys Used for Bearings

Low-tin-content aluminum alloy has been used for bearings in place of Babbit metals and bronzes for a number of years in Europe and the U. S., and is seeing increased use in England.

An example of this is Davy & United Engineering Co., Ltd., who now offers aluminum-6½%-tin alloy bushings in its Morgoil specialized bearing system for rolling mills as an alternative to white-metal steel-backed bearings.

Morgoil bearings with aluminum-tin bushings have been fitted in the back-up rolls of 7-foot and 12-foot steel rolling mills. One mill has recently completed three years' service, during which time more than 500,000 tons of steel were rolled. Examination showed the bearings to be in good condition.

Bushings for these bearings were cast from aluminum alloy supplied by Northern Aluminium Co., Ltd. The special alloy is particularly suitable as a bearing material where high loadings and speeds are encountered and where adequate lubrication is available. It is composed of 6½% tin, 2½% silicon, and 1% copper (balance aluminum). It has a 0.1% proof stress of 4 tons psi, ultimate tensile stress of 10 tons psi, and has been specifically developed for bearings that do not need a backing material for strength.

The metal's thermal conductivity is said to be three times that of steel and five times that of Babbit metal. But the material is plastic enough to conform to any normal misalignment, it embeds particles easily and is said to be highly suitable for heavy duty machinery.

Magnesium Use Up 28% in '59; Production Dips Slightly

Commercial production of primary magnesium in the U. S. reached 30,000 tons in 1959, a slight drop from '58, while consumption jumped 28% as users continued to draw upon the enormous stockpile of the metal which was built up in previous years.

Figures compiled by the Bureau of Mines, U. S. Department of Interior, showed last year's production to be only 96 tons under 1958. Consumption climbed to 45,000 tons, with primary metal still available from the record production year of 1957, when more than 81,000 tons of magnesium was produced. Preliminary compilations show recovery of secondary metal at 10,000 tons last year, 3000 more than in 1958.

The Dow Chemical Co's Freeport, Tex., electrolytic plant and the government-owned silicothermic plant at Canaan, Conn., operated continuously last year, while Alabama Metallurgical Corp. started production in November at its new silicothermic plant at Selma, Ala.

The 1959 base price of primary magnesium ingot in standard 42-pound pig form remained at 35.25 cents per pound, where it has been since August 1956. Producers' and consumers' stocks at the close of the year were estimated at about 60% of those reported in December 1958.

The Bureau reports that imports for the first 10 months of 1959 were just 12 tons below 1958's total imports. Exports for this period were 794 tons above 1958.

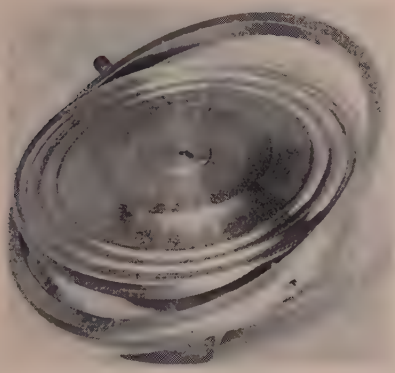
Russia's 45,000 tons topped all other countries, as 1959 world production duplicated 1958's 102,000 tons. Most totals for other countries approximated 1958 levels.

New Aluminum Cleaner Used in Pressure Washers

A new aluminum cleaner, No. 19, developed by Macco Products Co., 9210 S. Sangamon St., Chicago 20, is for use in pressure washer cleaning of aluminum and aluminum and zinc die castings. It can also be used on other nonferrous metals and as a combination cleaner for aluminum and steel.

If the material is used in pressure washers, 1 to 2 ounces is mixed per gallon of water at a temperature of 180°F. If used in a tank, 6 ounces is needed per gallon at a temperature as near boiling as possible.

The cleaner is effective on a variety of soils, has good wetting out properties, does not streak or water spot, is a long-lived solution, and rinses freely.



New Superalloy Forged Successfully

More power and greater payload in missiles and jet engines are now possible as the result of the first successful large closed-die forging of the world's highest strength, high temperature, superalloy, Astroloy, at the Wyman-Gordon-U. S. Air Force plant at North Grafton, Mass.

Announcement after 14 months of experimentation was made by Wyman-Gordon metallurgists.

"Sufficient development has been accomplished to enable us to guarantee minimum properties in forgings up to 40 inches in diameter," says M. E. Cieslicki, director of research and development. "These are the first forgings of this alloy ever produced.

"For the parts for which Astroloy can be used this means that operating temperatures of missiles and jet engines can be increased by as much as 200 degrees, which in turn means increased power and greater payloads for missiles and jet engines."

The Astroloy forging pictured is a turbine wheel with integral ring removed. Diameter is 26 inches; weight, 170 pounds.

MILL-TAILORED

TO YOUR NEEDS!

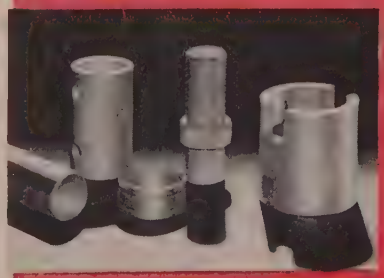
You name it and *Pfister* will manufacture your aluminum tubing to the exact form you want – forty foot lengths or cut to two inch pieces – packed on open skids or individually tissue-wrapped and boxed. Whatever I.D., O.D., gauge, alloy or finish you require, *Pfister* is ready and able to accommodate you. If you want your tubing to telescope, slip fit or force fit; just name it.

Pfister is noted for its exceptionally bright finishes and consistent high quality. At *Pfister* great care goes into each customer's order.

In keeping with its policy of tailoring tubing to your every need, *Pfister* offers a wide variety of fabricating facilities. Not only can you be sure of the finest quality and a range of services from *Pfister*, but you can count on fast delivery, too!

ALUMINUM TUBING

Drawn • Welded • Butt —— Rounds and Squares



ROLL FORMED SHAPES
COIL STRIP
REROLL and
SLITTING FACILITIES
EXTRUDED SHAPES
ANODIZING — Colors
PRECISION CUTTING

DEBURRING and DRILLING • BENDING and SWAGING

Write today for NEW free catalog

Pfister

ALUMINUM CORP.

50 West Allendale Avenue • Allendale, New Jersey

FIVE MANUFACTURING PLANTS — STOCKS IN VARIOUS CITIES

Hyde Park
Rolling Mill Equipment
RED CIRCLE Rolls ALLOY-CHILLED

Stretcher Levellers

Complete range of stretching capacities from 150 to 750 tons, for levelling ferrous and non-ferrous sheets in sizes up to 120" wide x 500" long.

Speeds and length of "stretch" to meet all requirements.

Adaptable for automatic cycling.

Bar Mills • Merchant Mills • Sheet and Strip Mills • Pinion Stands
Roller Tables • Reduction Drives
Stretcher Levellers • Roll Lathes • Guillotine Shears
Special Machinery • Sheet Mill Shears • Machine Work

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GRAY IRON CASTINGS

All-Aluminum Landing Craft Used by Royal Air Force

All-aluminum construction was adopted for a special-purpose ramped landing craft recently completed by the Fairmile Construction Co., Ltd., for England's Air Ministry. The vessel is for overseas service, and will carry 14½-ton refueling road tankers between ship and shore.

The hull is basically a simple watertight box section, the side plating of which is carried upwards to form the deck coaming. Framing is of extruded aluminum sections, three of the transverse frames being webbed, with pillars at every other frame. Length is 50 feet 4 inches, width 14 feet, and depth 6 feet. The machinery and bridge are in the rear leaving a vehicle deck of 30 feet.

Since the vessel has to be lifted aboard a ship, the maximum lifting weight specified was 15 tons. But, by using aluminum alloy construction the completed weight was kept to 11½ tons.

Aluminum plate and extrusions were supplied by Northern Aluminium Co., Ltd. Riveted construction, using aluminum rivets, was used throughout, though some small sub-assemblies were arc welded. Many of the extruded sections are of the efficient standard bulbed shape commonly used in shipbuilding.

The deck is partly timbered-over to provide a track for the vehicle, and timber fenders are used for the protection of the deck coaming and bridge bulkhead. Timber is also used for vehicle tracks on the aluminum ramp, and for external fenders.

The unit is powered by two 100-h.p. Diesel engines driving chromium-plated propellers through a 2:1 reduction and reverse gear box. Ferobestos water-lubricated bearings carry the stainless steel propeller shafts.

Modern Decor Sparked by Aluminum Furniture

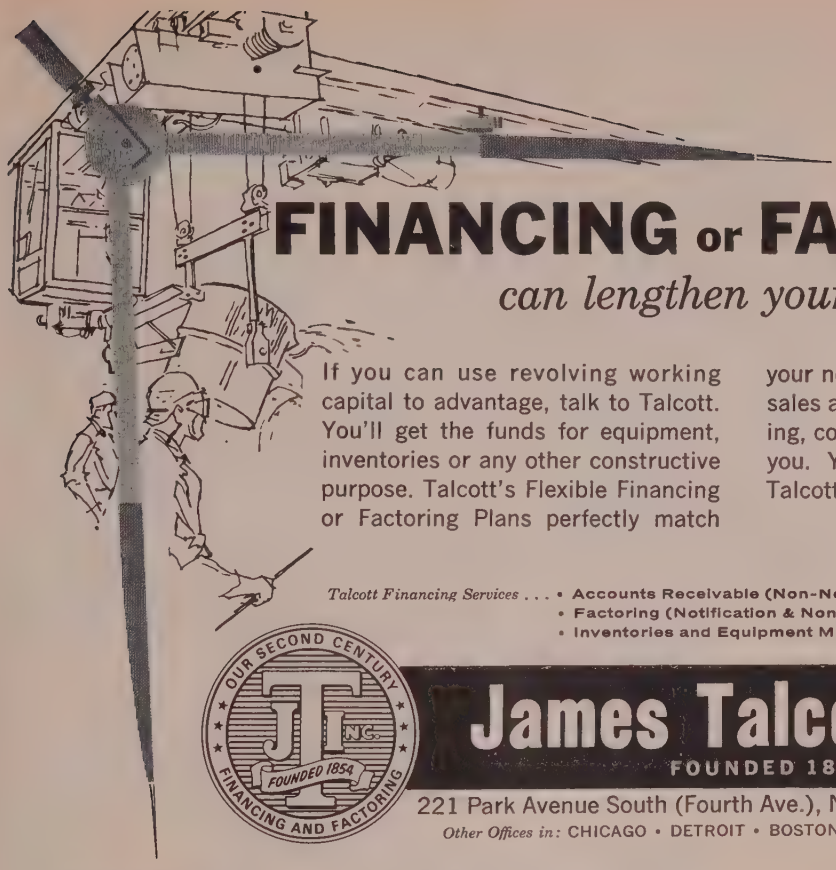
Modern office furniture—made of aluminum—has been developed in 12 new styles by the Industrial Design Department of Kaiser Aluminum and Chemical Sales Inc., Oakland, Calif.

Aluminum has been combined with other materials of various textures and colors to make different styles as unique as possible.

The light metal's formability has enabled Kaiser to make desk units with sweeping 90-degree curves, cantilever construction and split levels.

Kaiser says that in addition to modernistic styling it strived to perfect designs to measure up to rigid engineering standards so that production is both practical and economical.

Pictured is Kaiser's Satellite, a cantilever design in brushed aluminum. Desk top is aluminum sheet covered with metallic leather with a writing area made from clear lucite on a brushed aluminum base.



TALCOTT FINANCING or FACTORING

can lengthen your competitive lead

If you can use revolving working capital to advantage, talk to Talcott. You'll get the funds for equipment, inventories or any other constructive purpose. Talcott's Flexible Financing or Factoring Plans perfectly match your needs for increased production, sales and profits. To start things rolling, contact the Talcott office nearest you. You'll get full facts about a Talcott plan to help your business.

Talcott Financing Services . . . • Accounts Receivable (Non-Notification) • Industrial Time Sales • Factoring (Notification & Non-Notification) • Leasing • Inventories and Equipment Mortgages • Rediscounting

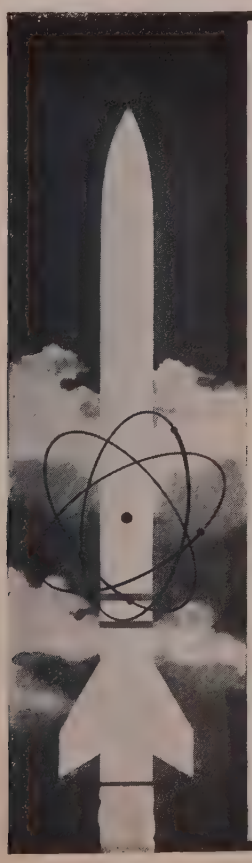
OUR SECOND CENTURY — JT INC. — FOUNDED 1854 — FINANCING AND FACTORING

James Talcott, Inc.

FOUNDED 1854

221 Park Avenue South (Fourth Ave.), New York 3, N.Y. • ORegon 7-3000

Other Offices in: CHICAGO • DETROIT • BOSTON • ATLANTA • LOS ANGELES



Aid for Technological Pioneers

in the fields of Missiles and Aircraft Electronics, Nuclear Energy

MAGNESIUM-THORIUM This lightweight material has creep resistance and good yield strength at elevated temperatures. B&P produces rolled HK-31 sheet and specializes in HK-31 assemblies for missile and electronic applications.

ELECTROPLATING OF MAGNESIUM Ideally suited to a wide range of electronic applications, electroplated Magnesium is easily soldered. B&P plates Magnesium with copper, tin, nickel, chromium, silver and gold to your requirements.

BORAL The first commercial source of Boral, B&P is equipped to supply assemblies as well as Boral plate in any concentration of boron carbide required for nuclear reactor use and other applications.

TITANIUM Using its techniques developed for Magnesium, B&P produces unusually deep draws in Titanium with a single stroke of the press. B&P also stretch forms, press-brake forms and welds Titanium fabrications.

FREE DATA BOOK on Magnesium and Titanium. Comprehensive, illustrated, physical properties, design data, etc. Write on your letterhead to:

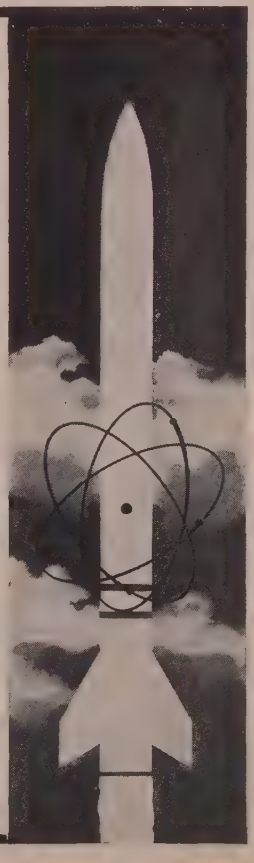
B&P

60-T-1

BROOKS & PERKINS, INC.

1954 WEST FORT ST., DETROIT 16, MICH.

TASHMOO 5-5900



Yoder Tube Mills speed tailpipe production at AP Parts Corporation

The AP Parts Corporation (Toledo, Ohio), world's largest producer of replacement mufflers and tailpipes, uses 2 YODER Tube Mills to produce more than *300* ft. of 1¾", 1⅞" and 2" tubing per minute.

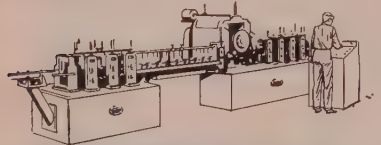
According to Mr. John Grindle, Plant Engineer, the two-man operated YODER Mills are vital to the production of the entire plant. "YODER Tube Mills earn their keep daily. They are easy to set up, maintain and operate ... the welds are clean and uniform. We depend on them for constant quality, high production and minimum downtime".

The YODER Tube Mills at AP Parts exemplify the production economies and dependability of all YODER-built equipment, whether it be Pipe and Tube Mills, Cold Roll-Forming Machinery or Slitting Equipment.

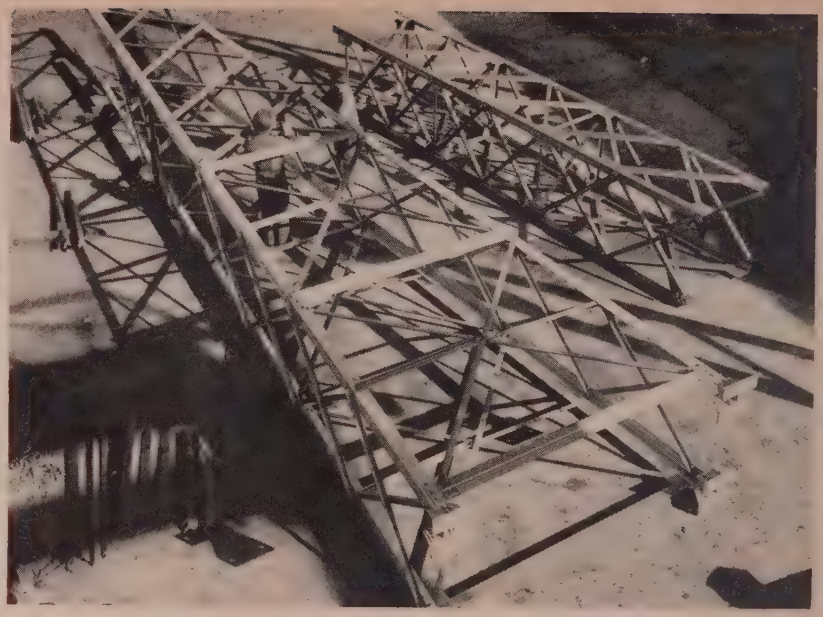
If your products require ferrous or non-ferrous pipe or tubing, from ¼" to 26" diameters, there is a YODER Mill designed to produce it economically, accurately and efficiently.

For complete information on YODER Pipe or Tube Mills ... write for the fully illustrated, 88 page YODER Tube Mill Book ... it is yours for the asking.

THE YODER COMPANY
5539 Walworth Avenue • Cleveland 1, Ohio



ENGINEERING YODER MANUFACTURING
PIPE AND TUBE MILLS
(ferrous or non-ferrous)



New Power Line Has Biggest Aluminum Station

General Electric Co. is preparing for the vast future power needs of the U. S. In order to acquire the technical information that will help the electrical industry satisfy these needs efficiently and economically, GE is sponsoring construction of a power line to carry the highest voltage ever transmitted.

GE's Project EHV (Extra High Voltage) power line, now being constructed in western Massachusetts, will be served by the world's largest aluminum substation, portions of which are pictured above.

The pre-assmbly is shown in the fabricating facilities of Lee C. Moore Corp., Pittsburgh. Shown at left is one of four tapered lattice columns for the two portal-type towers of the North Station. Shown at right is one section of the box-type lattice trusses that will span the two upright supports. Larger of the portal-type towers (not shown) will be 68 feet high, with a 123-foot span between the two vertical supports.

The structure is one of several contributions to the line made by Aluminum Co. of America. The company's structural division manager, P. T. Coffin, thinks it "will serve as dramatic proof of the intensity of the aluminum industry's move into the structural field.

"It represents the newest such activity by Alcoa, which built the world's first aluminum substation in New Kensington, Pa. in 1947," Coffin said. "We have since seen aluminum become a familiar material in utility substation construction."

The GE program will explore the implications of tomorrow's transmission voltages, looking to a future transmission voltage three or more times today's typical 220 KV.

Virtually all materials used in the substation—including brace rods, turnbuckles, bolts, posts, rails, and gates—are of aluminum. Aluminum chain link fencing protects the station.

Alcoa Buys Its Way Out Of Ingot Pact With Limited

Aluminum Co. of America and Aluminium Limited have reached a settlement in the disposition of 59,000 tons of aluminum pig, part of a 600,000-ton order contracted for by Alcoa in 1953. Limited is accepting $9 million and will not ship the metal.

According to the contract the aluminum was to be paid for on the basis of the U. S. market price at the time of shipment. Based on 26 cents a pound, today's pig price, Alcoa would have had to pay about $30 million for this tonnage which was to be shipped during 1960 and '61.

The original contract was signed during the Korean War, when demand for the light metal was much greater than supply, with no chance that U. S. facilities could be expanded in time to alleviate the shortage. Originally, the contract was to expire in 1958 but was extended to 1962. Some 20,000 tons still remain to be negotiated.

Furnace Builders Merge for Broader Sales Coverage

Ajax Electric Co., Frankford and Delaware Aves., Philadelphia, Pa., and Barkling Fuel Engineering Co., 400 N. Paulina, Chicago, have merged, according to Leon B. Rosseau, Ajax president.

Thus, in addition to its electric salt

bath furnaces, Ajax Electric Co. will now offer a complete line of Ajax Barkling gas-fired heat treating and melting furnaces. These will be sold and serviced by Ajax sales-engineering representatives in 20 strategically located industrial centers throughout the nation, Rosseau said.

Included in the Ajax-Barkling line will be gas-fired pot type heat treating furnaces for use with salt or lead; furnaces for melting all nonferrous metals; small tool and shop furnaces for general hardening; large and small oven-type furnaces; full muffle furnaces; and oven-type and slot-type forge furnaces.

Ajax-Barkling furnaces will continue to be produced at the Barkling Chicago plant under the management of Harold Johnson.

New Louvers Offer Replaceable Parts

A new line of fixed and adjustable aluminum ventilating louvers, featuring inter-changeable parts and outstanding simplicity of assembly, have been introduced by Walcon Corp., Ecorse, Mich.

Slated for use in applications ranging from quality residential to heavy industrial, the louvers are available in standard sizes, ranging up to 12-foot heights and five-foot widths. They are produced from heavy-duty, 0.063-inch aluminum sheet.

Because all parts of the new Walcon louver are inter-changeable, single damaged sections may be replaced without having to destroy the complete unit, according to the producers. Bird screening will be available, either for inside or outside surfaces.

The mechanical fastening system used on the new product makes possible prefinishing in any of the popular aluminum treatments, such as color anodizing, porcelainizing, baked enamel or painting. It also can be fabricated with the many patterned sheets available in aluminum.

No welding is needed. Only eight aluminum screws hold the unit together.

Extrusion Die Users . . .

FORGED DISC

CAPITOL of the U.S.A.

★ COMPLETE STOCKS
All popular sizes available

★ H-12 FORGED DISCS & BAR STOCK
To meet all extruder requirements

★ GUARANTEED A.I.S.I. STANDARDS
Rigid tolerances and specifications, certified analyses

★ PRICED F.O.B. YOUR PLANT*
Immediate shipment from warehouse

★ SPECIAL SIZES STOCKED
We stockpile to your special needs

Distributor of world-famous Bohler Steels . . .

U. N. ALLOY STEEL CORP.

Boston 27, Mass. — ANdrew 8-7960

**F.O.B. your plant east of Mississippi*

Write for Price & Stock Lists

Complete technical data is available

Yes, please send me your hot work steel catalog.

NAME _____

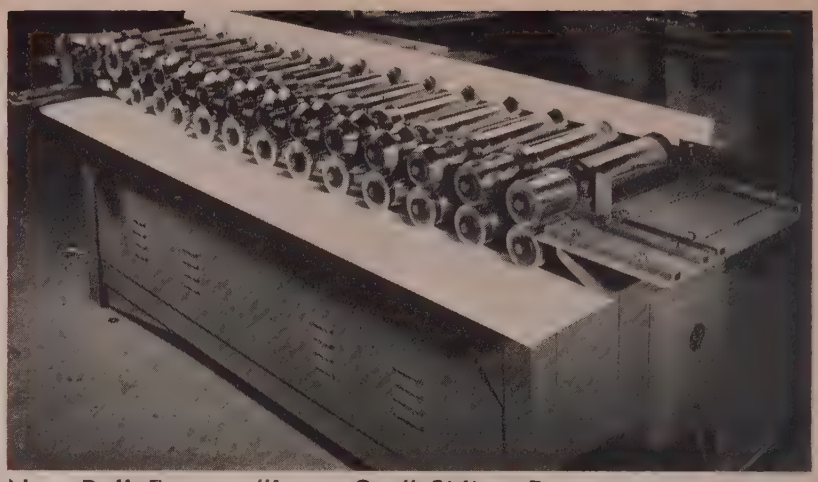
COMPANY _____

ADDRESS _____

CITY _____ STATE _____

MR. S. M.:

- Want a big bonus next year?
- Want to make the boys in the back work seven days a week?
- Want to develop some new prospects and customers in 1960?
- Then an ad this size will help. It's done it for other firms.
- Only $70 per month on an annual basis.
- Write Paul Muni, Modern Metals, Tribune Tower, Chicago 11, Ill. for details.



New Roll Former "Irons Out" Siding Bugs

A new roll forming machine for building siding production is the product of five years of intensive experimentation at Schenectady Venetian Blind Manufacturers, Inc., 1887 State St., Schenectady, N. Y. Jack Lazarow, president of the firm, believes that this new creation will "revolutionize the siding industry."

The 14 stage machine rolls pre-coated stock at a rate of 60 feet per minute. It is able to produce siding and all accessories to complete a house siding job, as well as pre-punch nail and vent holes. It also contains pre-notch and flying cut-off attachments. The fully automatic unit can be operated by one man.

Lazarow explains that by using 14 stages camber, oil canning and other defects often experienced with more expensive machinery are prevented.

The machine sells for less than $10,000. Lazarow says "any average outfit should be able to amortize the cost of the machine within a short time, based on the present market."

Another Giant Press For Lafayette Works

A new 14,000-ton extrusion press went into operation at the Lafayette, Ind. works of Aluminum Co. of America. It is the twin of a press operated by Alcoa under the Air Force Heavy Press Program and, as such, will enable civilian users of aluminum to order large-size extrusions heretofore limited to the military.

The Schloemann unit is capable of extruding single pieces of aluminum in extreme lengths, with widths up to 39 inches, and weighing as much as 2500 pounds.

The huge press is viewed as a boon to such industries as transportation, architectural, marine, building products, electrical, and chemical processing.

"The unprecedented opportunity to obtain parts that combine 'bits and pieces' into single, high strength sections will provide dollar savings and structural advantages never before possible," Alcoa said.

With the greatly expanded extrusion capacity now available to civilian users, the company will produce extremely large diameter seamless pipe with outside diameters of 20 inches and greater; column covers and curtain walls; big tubes for masts and booms in merchant vessels; large sections for highway trailer flooring, hatch covers, hydrofoils, deckhouses, and highway signs; and structural shapes for many other applications now requiring parts built up from small pieces.

Optical alignment was used in the installation of the giant press which has components weighing as much as 120 tons. This is the most exact of measuring techniques calling for highly sensitive instruments.

Reynolds to Build Silicon Metal Plant

Reynolds Metals Co. will build its first silicon metal facility, at the Listerhill, Ala. reduction plant, to handle increased production of silicon aluminum alloys for the foundry industry. Construction will begin around mid-year.

Electric furnace operations will have a capacity of about 5000 tons of silicon metal per year. The 3600°F furnace will be supplied by the Electromelt Furnace Div'n of McGraw-Edison Co., Pittsburgh. The plant is being designed by Reynolds' Central Engineering Department so that additional furnaces may be added later.

It is expected that silicon production at this plant will fulfill silicon requirements at Listerhill and a portion of that needed by other Reynolds reduction plants.

EXTRUSION SALESMAN WANTED

by well established Midwest extruder having complete facilities.

Qualified man to cover Wisconsin, Illinois, parts of Indiana.

Good salary, plus commission, with excellent potential for right man.

Write in confidence to box 399, Modern Metals, 435 N. Michigan Ave., Chicago 11, Ill.

For Sale | Book Type Molds | Billet Casting | Plant Components

write BOX 315

Modern Metals, 435 N. Michigan Ave., Chicago 11, Ill.

Preston Carter and a mountain of confidence

R. Preston Carter is a typical Alcoa salesman. Our picture shows him leaning on a stack of aluminum pig, confident that he will always be able to depend upon Alcoa to meet his customers' pig and ingot needs.

We've called the stack of pig a "mountain" because that's the impression we always get when we walk among such stacks at any of Alcoa's many producing locations, where "mountains" like this are constantly being built and torn down again for shipment. And, as "Pres" will tell you, Alcoa, the world's largest producer of primary aluminum, has more smelting facilities under construction than any other basic producer.

A 25-year veteran with Alcoa, Pres knows his company shares his faith in the market for primary aluminum and is keeping pace with the requirements of an expanding economy.

Pres' knowledge of the light-metal foundry and extrusion industries is as much a part of him as his mustache. He's watched them grow, fostered their ambitions. As a metallurgist with experience in several of Alcoa's plants, he has confidence in his product and is convinced that Alcoa's quality control leads that of all the other smelters. Pres knows Alcoa will always back him up with a better product and more of it, better delivery and more experienced technical assistance than his competitors can provide.

As a continuing source for aluminum pig and ingot, Alcoa, the company with more faith in the market, is your soundest choice. Just call your local Alcoa sales office (you'll find it under "Aluminum" in the Yellow Pages of your telephone directory).

Send for Alcoa's New Pig and Ingot Brochure

This new 12-page booklet lists all grades and alloys available in pig, ingot and billet form, together with their composition and properties. It also describes the services and technical assistance available from Alcoa's metallurgical staff, the most experienced and unbiased in the industry. Write today: Aluminum Company of America, 2119-C Alcoa Building, Pittsburgh 19, Pa.

Your Guide to the Best in Aluminum Value

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

ALCOA ALUMINUM

HARVEY PRIMARY ALUMINUM
Aluminum pig · ingot · billet
SHEET AND EXTRUSION
CALL PIG AND INGOT SALES MANAGER DIRECT HARVEY Aluminum TORRANCE, CALIFORNIA FAIRFAX 8-0660 COLLECT

Four Mills Roll All Gauges To .006-Inch At Omal Plant

Four hot and cold reduction mills at Olin Mathieson Chemical Corp.'s new Omal, Ohio plant are used to produce 10 million pounds a month or better of flat aluminum products. Gauges range from slab and plate down to .006-inch strip in widths up to 66 inches. Plate widths can go to 90 inches.

The mills, designed and built by E. W. Bliss Co's Rolling Mill Division, include a 30"/36" & 55" x 96" four-high reversing hot mill used for breakdown, a 21" & 53" x 80" four-high tandem hot finishing train, a 21" & 53" x 72" four-high 2-stand tandem cold mill, and a 12"/16" & 53" x 72" four-high single stand cold mill. Besides the mills, Bliss supplied the auxiliary equipment, including roller tables, side trimmers, edgers, shears, scrap choppers and coil handling equipment.

Rolling cycle at Omal begins with 10,000-pound aluminum ingots ranging up to 20 inches thick. A series of passes in the reversing hot mill reduces these to ½-inch or less. Width of the slab is controlled by a vertical edger. The plate produced moves down the runout table to 2 x 96-inch upcut shear where its ends are trimmed. If it is to undergo further rolling, it continues along the 354-foot powered roller table to a second shear and side trimmer followed by the tandem hot mill, where the hot finish rolling is accomplished.

As it is delivered from this mill, its edges are automatically trimmed and the material is coiled on a tension reel equipped with a horizontal belt wrapper. This coiling arrangement for a hot mill is made practical by the relatively low temperatures used in hot rolling aluminum.

The coils of hot rolled aluminum strip are then transferred to the tandem cold mill. Strip arriving at this mill ranges in gauge from .140 to .250-inch, and can be rolled to .012-inch finished thickness in several passes from the second stand. The mill can roll widths up to 66 inches and the dual uncoiling equipment, which includes a bridle unit and a coil box for the heavier gauges as well as mandrel-type payoff reel and tension reel with horizontal belt wrapper for the lighter gauges, can handle 10,000-pound coils.

The cold finishing mill is a four-high single-stand mill capable of cold reducing aluminum from .150-inch to .006-inch in several passes at speeds as high as 2,500 feet per minute. Feed and coiling equipment includes mandrel-type payoff reel on the entry side, and tension reel and horizontal belt wrapper on the delivery side.

Bridgeport Contemplating Aluminum Pig Production

Bridgeport Brass Co. is considering starting its own production of aluminum pig and ingot, probably in association with another firm. Austin R. Zender, president of the firm, recently disclosed.

The company is currently expanding present aluminum production facilities, which handle primary metal purchased from all U. S. producers, and Aluminium Ltd.

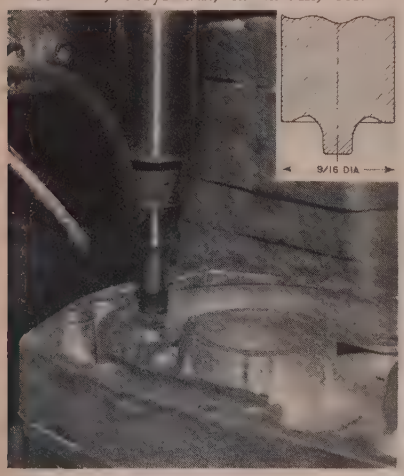
A mill to turn out 24-inch strip will be installed at Warren, Calif., as will a line to produce painted strip. Future plans call for equipment to produce sheet and strip up to 48 inches wide. These will be re-roll operations but at some future date, according to Zender,

the plant will become completely integrated with melting, casting and hot rolling facilities being added. The firm's Riverside facility, which produces strip for blinds and awnings, is being expanded, too.

Zender says his firm is concentrating on expanding its sheet, strip and plate products because this is the area of the industry where more than 50% of sales take place — and where the greatest growth potential lies.

At the moment, approximately 25% of Bridgeport's sales are of aluminum. Records show, however, that the copper industry grows at a steady 2% rate a year, while aluminum is exploding at a pace which sees consumption doubling about every 10 years. Because of this Bridgeport is planning now to increase production with top capacity of its aluminum products expected to be reached by 1965.

Other future possibilities for the company include formation of an international organization headquartered in Switzerland, and increased work with metals such as titanium, molybdenum, zirconium, beryllium, tantalum, etc.

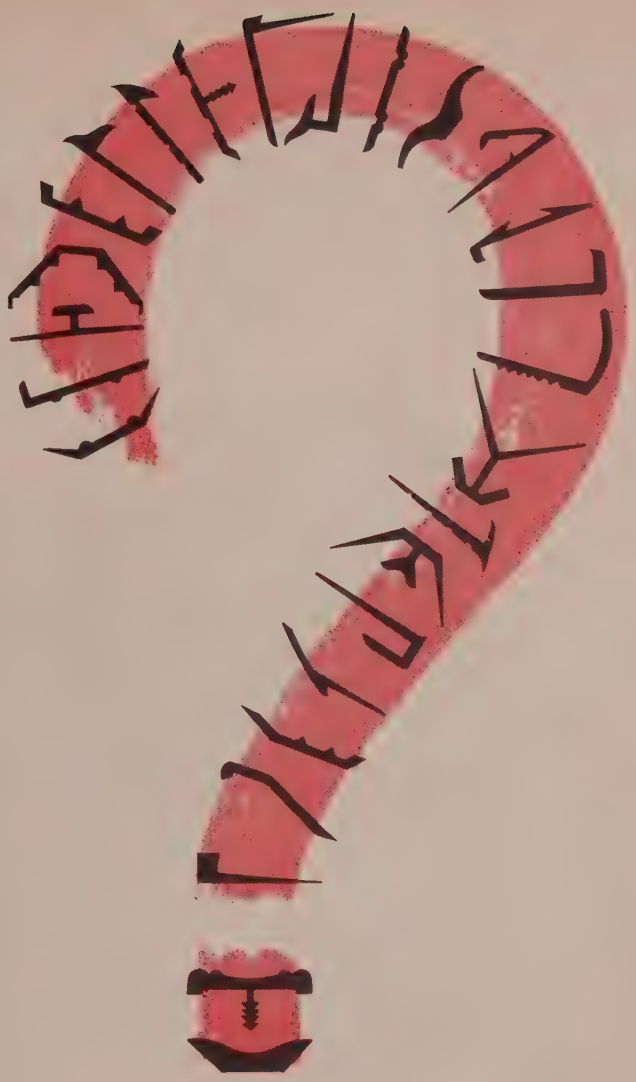


Allison Slashes Costs With New Rivet Tool

A change of material in a rivet spinning tool used to assemble a part in a die cast aluminum housing has saved Allison Division, General Motors Corp., Indianapolis, $1338 on the first 36,000 pieces assembled.

The riveting operation entails cold spinning five aluminum rivets — 5/16-inches O.D. with 1/16-inch wall — to attach a horseshoe-shaped part to the cast housing. The old tool produced an inferior finish and tore rivets which caused rejects and machine downtime.

The new tool is of hard carbide, and is manufactured by Kennametal Inc., Latrobe, Pa. It is 9/16 inches in diameter, 3-5/16 inches long, and has a riveting head on each end. It cost $16, but helped save this amount before the first 1000 pieces were assembled.



You'll never know how well we can serve you... until you call us

If you have an extrusion problem . . . call us.

If you need quick die service . . . high quality . . . close tolerances . . . speedy delivery . . . color anodizing, we can help you. We serve all types of industries with extrusions and precision aluminum mouldings. Our people are experts . . . our equipment the finest. Try us. Call us today.

SUPERIOR INDUSTRIES INC.

ALUMINUM EXTRUDERS • ANODIZERS • ARTRIM MOULDINGS

3787 Oakwood Ave. • Youngstown, Ohio

Welded Aluminum Pool Installed in N. Y. Coliseum

The largest swimming pool ever installed in the New York Coliseum provided grandstand entertainment to visitors at the recent National Swimming Pool Show. The 55,000-gal. pool was the site of swimming races, water ballets, synchronized swimming, and skin and scuba-diving demonstrations.

Sigma welding enabled Chester Products, Inc., Hamilton, Ohio to install the 30 x 60 foot all-aluminum pool in just 35 hours. Chester's three-man team first laid the pool floor sections in place on the floor of the auditorium, then joined all seams with Sigma welding. The HW-11 torch completed these seam welds at a speed of 20 ipm, using Alcoa 5154, 1/16-in. diameter aluminum wire.

Linde argon shielded all welds against oxidation. Power equipment was supplied by Hobart Brothers. All welds were vacuum-seam tested using the soap-suds technique.

Next, the 30 x 4½ foot wall sections were carefully positioned and tack-welded to the floor. These wall sections contain complete integral piping for the pool, and are constructed of 5050-H34 aluminum alloy plate. Angular braces

of aluminum channel were fastened to the outside of pool walls to make the entire pool assembly self-supporting.

Wall sections were then Sigma welded and the floor seam was completed all the way around, to make the pool leakproof. Special corner sections were fitted and welded in place to complete the pool assembly.

Specialists in small seamless aluminum tubing . . . competitive in price with first quality imports.

LaPointe offers a complete variety of operations, all under one roof for maximum quality control and manufacturing economy. Specify LaPointe for the finest seamless aluminum tubing, precision made to your requirements.

La Pointe INDUSTRIES INC.
ROCKVILLE, CONNECTICUT

Write for Complete Details . . .

Men-on-the-move

Wells Aluminum Corp., North Liberty, Ind., manufacturer of aluminum extrusions, has named **Lewis C. Laderer** president, following the resignation of Cloyd D. Nickison. Laderer had been Wells' executive vice president. He joined Wells in 1953 following a 10-year association with Alcoa.

Joe Promisloff has been named sales manager of the Industrial Extrusion Division of Corson Industries, Delair, N. J.

William N. Brammer has been named vice president-marketing of Precision Casting Co., Cleveland, a division of Precasco Corp. The division is one of the largest producers of aluminum and zinc die castings. Brammer's experience includes nine years with the light metals division of Thompson Ramo Wooldridge Inc., where he was in charge of all foundry and die casting work.

Reorganization of Alcoa's sales department top management coincides with the retirement last month of **Ralph V. Davies,** vice president in charge of sales and a veteran of 41 years with the company. **Robert B. McKee,** now vice president in charge of direct selling and distribution, will succeed Davies as vice president in charge of sales. **F. J. Close,** presently vice president in charge of sales development and industry sales,

will assume the newly established post of vice president and general sales manager.

L. P. Favorite, vice president in charge of product sales and commercial research, will continue in charge of these responsibilities. **William S. McChesney,** currently manager of industry sales, will move to the new post of general manager of market research and planning.

Financial Briefs

Olin Aluminum Expects Profit This Year

A joint statement by Thomas S. Nichols, chairman, and Stanley de J. Osborne, president, of **Olin Mathieson Chemical Corp.** noted that "1959 was a year of significant progress" for the company.

"The most important event of the year was the completion of our entry into the aluminum industry," they said. They foresaw 1960 as Olin's "first profitable year in aluminum." Losses from the corporation's aluminum operations in 1959, which were absorbed in operating net income, were $5,041,000, or 38 cents a share. Overall, consolidated net sales totaled $702,032,000 in 1959, an increase of 17% over the '58 total of $601,398,000. Net profits amounted to $37,416,000, or $2.81 a share, compared with 70 cents a share in 1958 when heavy non-recurring write-offs sharply reduced the year's income.

Kaiser Sales Rose in '59

Net sales of **Kaiser Aluminum & Chemical Corp.** for 1959 were $435,550,000, compared with $408,559,000 for '58. Net income was $22,328,000, or $1.17 per common share after preferred dividends. Net income in '58 was $25,232,000, or $1.43 per share. The decrease in earnings was due to higher depreciation charges, increased labor and marketing costs, and slightly lower prices for aluminum products, the company said. The provision for depreciation was $44,561,000, an increase of $8,581,000 over 1958.

Bridgeport Brass Had Record Sales, Profits in '59

Record sales and earnings were reported by **Bridgeport Brass Co.,** Bridgeport, Conn. Sales for the year totaled $173,050,019, an increase of 28% over sales in 1958 of $135,667,800. Net income last year amounted to $7,131,643, a 53% gain over the year before, equal to $4.40 a share. Business so far in 1960 has been slower than expected, according to Austin R. Zender, Bridgeport president. However, February's volume was an improvement over January, and March could turn out to be better than February.

Calumet & Hecla Shows Substantial Gain

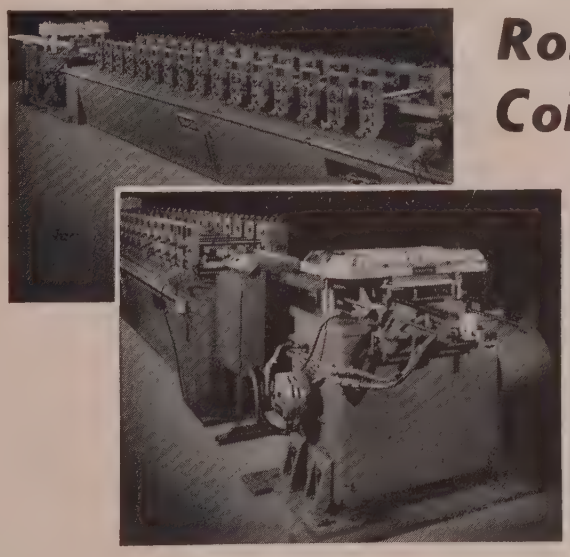
Calumet & Hecla, Inc., Chicago, reported sales in excess of $80 million in 1959, up from $54 million sold in the preceding year. The company's tubing business (Wolverine Tube Division, Detroit) contributed to the increase; the order backlog this year is a little better than last, according to Horace Y. Bassett, president, who said that facilities for the production of Strubing will have to be built this year. Strubing is Wolverine Tube's patented inflatable strip for on-site production of tubing in many types of metals, including aluminum. The new development met with greater interest than had been anticipated, Bassett said.

Alcoa '59 Revenues, Earnings Well Ahead of Preceding Year

Gross revenues of Aluminum Co. of America in 1959 rose well over the 1958 mark, with a corresponding increase in earnings. In the company's annual report, president Frank L. Magee and chairman I. W. Wilson attributed the gains to higher output and an improved product balance.

Alcoa had gross revenues of $864,967,722 last year, compared with $758,143,787 in '58. Earnings in 1959 amounted to $55,570,850, equal to $2.52 a common share, compared with $42,885,230, or $1.96 a share in '58.

The concern produced 627,000 tons of primary aluminum in 1959, compared with 520,000 tons produced in 1958.



Roll Form Coil Stock • BY THE MILE

Fully coordinated roll forming production lines, such as the above Ardcor installation, produce finished products on a miles-per-day basis.

Here an embossed, aluminum section of .019" stock is being formed by a leading aluminum manufacturer at a rate of 200 ft. per min. An Ardcor Prenotch Press, lower photo, and an Ardcor Cut-Off Press, upper left top photo, complement the high performance of the popular Ardcor 1-F Roll Forming Machine.

Ardcor can furnish complete roll forming lines for a wide variety of shapes and sizes — to customer specification.

Let us evaluate the greater production possibilities of your products. Write us.

American **ROLLER DIE CORP.**
29510 Clayton Avenue Wickliffe, Ohio

ARDCOR

DESIGNERS, ENGINEERS AND BUILDERS: Single Roll Forming Machines or Completely Automated Production Lines for Cold Forming; Ferrous and Non-Ferrous Electric Weld and Lock Seam Tube Mills • Forming Rolls, Tubing and Pipe Rolls • Straightening, Pinch and Leveller Rolls • Cut-Off Machines • Slitters

ADVERTISERS • Their Products & Equipment

Materials

CLEANERS for ALUMINUM
Northwest Chemical Co. 53

CHEMICAL FINISHING
Alchemize Corp. 32
Heatbath Corp. 26

COATINGS for ALUMINUM
Eastman Chemical Products, Inc. 43
The Sherwin-Williams Co. 58 & 59

DIE STEEL
Latrobe Steel Co. 47
U. N. Alloy Steel Corp. 103

DISTRIBUTORS
Atlantic Aluminum & Metal Distributors, Inc. 32
A. M. Castle & Co. 51
Peter A. Frasse & Co., Inc. 112
Earle M. Jorgensen Co. 95
Kaiser Aluminum & Chemical Corp. 86 & 87
A. B. Murray Co. Inc. 91
Precision Steel Warehouse, Inc. 24
Production Metals, Inc. 22
Joseph T. Ryerson & Son Inc. 8

ETCHANT for ALUMINUM
Frederick Gumm Chemical Co. Inc. 82

EXTRUSIONS
Corson Industries 65
General Extrusions Inc. 13
North American Extrusions Corp. 14
Rogers Industries Inc. 30
Southern Extrusions Inc. 41
Superior Industries Inc. 107

EXTRUSIONS, IMPACT
Harvey Aluminum 85

EXTRUSIONS, MAGNESIUM
The Dow Metal Products Co. 36 & 37

FORGINGS
Wyman-Gordon Co. 73

LUBRICANTS for ALUMINUM
Acheson Colloids Co. 63
Graphite Products Corp. 16

PIG, INGOT, BILLET
Aluminium Limited 11
Aluminum Co. of America 105
Aluminum & Magnesium Inc. 79
Apex Smelting Co. 4th Cover
Federated Metals Div'n 81
Harvey Aluminum 106
Olin Aluminum 55

PRE-ANODIZED STRIP
Fromson Orban Sales Corp. 75

PRE-PAINT TREATMENT
Amchem Products Inc. 20 & 21
Oakite Products Inc. 97
Parker Rust Proof Co. 68 & 69

REFRACTORY PRODUCTS
Babcock & Wilcox Co. 57
Refractory Products Co. 96

SHEET, ALUMINUM
Aluminum Foils Inc. 89
Bridgeport Brass Co. 28 & 29
Kaiser Aluminum & Chemical Corp. 23
Quaker State Metals Co. 67
Reynolds Metals Co. 5 & 6
Scovill Mfg. Co. 3 & 4
Sheet Aluminum Corp. 33

TUBE, ALUMINUM
LaPointe Industries Inc. 108
Pfister Aluminum Corp. 99
Wolverine Tube Div'n 25

Equipment & Services

ANALYTICAL EQUIPMENT
Baird-Atomic, Inc. 92

ANODIZING RACKS
Servi-Sure Mfg. Co. 10

ANODIZING SOURCE
City Plating & Polishing Co. 24
Colors, Inc. 10

BEARINGS, ROLLING MILL
Morgan Construction Co. 39

CUT OFF PRESS
Michigan Roll Form, Inc. 10

DIE CASTING MACHINES
Cast-Master Div'n 15

DRAWING, CUTTING, STRAIGHTENING MACHINES
American Laubscher Corp. 17

EXTRUSION DIES
Moczik Tool & Die Works 7
PMD Extrusion Die Co. 61
Superior Extrusion Tool & Die Co. 96

EXTRUSION PRESSES
Feller Engineering Co. 93
Watson Stillman Div'n 27

EXTRUSION PRESS TOOLS
Ajax Steel & Forge Co. 2nd Cover

FINANCING SOURCE
James Talcott, Inc. 101

FURNACES — MELTING, HOLDING, HEAT TREATING
Ajax Magnethermic Corp. 19
Granco, Inc. 45
The Lanly Co. 31
The Carl Mayer Corp. 16
W. S. Rockwell Co. 94
Sunbeam Equipment Corp. 35

HARD COAT FOR ALUMINUM
American Anodizing Inc. 3rd Cover

MAGNESIUM FABRICATOR
Brooks & Perkins, Inc. 101

PNEUMATIC TOOLS
U. S. Air Tool Co. 12

ROLL FORMING MACHINES
American Roller Die Corp. 109
Arnold Metals & Machinery, Inc. 18
The Lockformer Co. 83

ROLLING MILLS
E. W. Bliss Co. 49
Loma Machine Mfg. Co., Inc. 98
Pittsburgh Engineering & Machine Div'n 71

SAWS, CUT-OFF
Oliver Machinery Co. 18
Wallace Supplies Mfg. Co. 34

STRETCHER LEVELLERS
Hyde Park Foundry & Machine Co. 100

TUBE MILLS
The Yoder Co. 102

COMING UP:

Lots of informative reading in MODERN METALS.

For instance —

Aluminum Battles Glass in Boat Building

Super Purity Aluminum — How It's Made; Where It's Used

This Cast Furniture Gets Slick Finish

How To Fasten Aluminum

Aluminum Foil in Electrical Coils

Cutting, Straightening, Polishing Aluminum Rod and Tube Automatically

Extruded Grille Decorates and Ventilates

Only a partial list of course. But if you want to be in on ALL light metals developments be sure to fill in this subscription form.

Modern Metals — 435 N. Michigan Ave., Chicago 11, Ill.

Enter my subscription for a period of ..... years.

NAME .....
POSITION .....
COMPANY .....
BUSINESS .....
ADDRESS .....
CITY ..... ZONE ..... STATE .....

For fabricators or users of aluminum:
3 yrs., $6.00;
2 yrs., $5.00;
1 yr., $3.00.
Check enclosed ☐
Bill me ☐

Looking Ahead

Is business going to hell in a basket? Lots of people say it is. "Hogwash," declare manufacturers of aluminum Christmas trees. The product will be a sellout again this year, they say, and business will be up at least 200% over 1959 — when about a million trees were sold. We made an exhaustive survey of the "big twelve" in this industry, and, to a man, they believe the evergreen tree has had it: that 3 million aluminum trees will be sold by next December. One outfit's making "off-the-tree" colored spot and flood lights and expects to sell a million of them. Our survey revealed that these shimmering trees with their high reflectivity and fireproof features have captured the fancy of the masses; that 60 million dwellers will buy at least one during the next three years. This is good because it will preserve our forests. But what about the replacement market? While this is a big outlet for aluminum, we believe the aluminum Christmas tree manufacturers overlooked an important statistic: In the Farmers' Almanac we found that six million people in this country own dogs. We wonder whether this booming industry isn't aligning its sales sights on the owners of the non-retromingent species, which is about half the total population of the carnivorous mammal.

In Russia big new markets are opening for aluminum, copper, lead and tin, and manufacturers of screens, bathroom fixtures, windows, chandeliers, hardware, appliances, ladders, giftware — in fact anything that is made of nonferrous metals. In an effort to fulfill its seven-year plan, the Soviet Communist party recently stated that nonferrous metals must be conserved . . . because further production increases would require enormous capital plus a large labor force. The Party said that nonferrous metals are being squandered, especially for consumer goods, despite the fact that output of same will be doubled or tripled by 1965. The Party recommends that the non-capitalistic businessmen use glass, plastics, wood and other substitutes. Only a year ago some U. S. nonferrous producers screamed that Russia was waging economic warfare on the U.S.A. by dumping surplus aluminum on world markets. While it might be hard to admit that this country has a surplus of nonferrous metals — and we would, in a sense, be waging economic war on Russia — maybe we should offer to sell them a million tons of nonferrous metals to tide them over until their capacity catches up with demand. On the other hand, maybe our government is smarter than we give it credit for being. We don't want to be alarmists, but didn't Hitler say that Germany had to conserve its nonferrous metals back in 1938? Regardless, if you want to sell your production, maybe the thing to do is acquire a Russian sales agency and run some ads in the Party's better trade magazines.

Senator Murray, the high-tariff Democrat from Montana, and chairman of the Senate Interior Committee, apparently thinks the U.S. aluminum producers are in danger from aluminum abroad. On March 4th he introduced a bill to increase the duty on primary aluminum pig from 1.25 to 4c a pound. What the the Senator probably doesn't know is that the U.S. is now a big seller of aluminum pig to Britain; that if we pushed the duty up here, it would automatically go up in Britain for U.S. aluminum. That could mean that the British market would go to Canada because there's no duty on Canadian metal over there. This tariff question comes up next year, but there's no chance of an increase.

A 10% tariff on aluminum going into the six European Common Market countries has been set up. Ditto for magnesium. It is noted that aluminum scrap is exempt. Their big supplier, Alcan, was pushing for lower tariffs (see page 56); the French wanted 12%; and the Italians 15%.

The French wanted more protection because the big aluminum producer, Pechiney, just opened a new $40 million reduction plant in Southwestern France, where it uses natural gas. This will increase its production one-third to 200,000 tons —only half of its five-year goal. Pechiney, Europe's largest aluminum producer (sales hit $300 million last year), claims this is the most highly automated plant in the world. When it has surplus aluminum to sell, Pechiney is a tough competitor in any world market.

Imported magnesium ingot alloyed with either thorium or zirconium now has a higher duty rate than pure magnesium. The U. S. Bureau of Customs ordered an unpublished increase for magnesium ingot containing 20% thorium and sintered magnesium containing 40% zirconium. Seems as how producers of thorium and zirconium have also asked for protection.

All this talk of the slipping sixties doesn't deter some aluminum producers from upping production or expanding capacity. This month Alcoa started a sixth potline at its Point Comfort (Texas) plant, which shoots Alcoa's operating capacity up to 86%. Reynolds will activate another potline at its Messena smelter, raising its capacity to 67,000 tons annually. Out in Columbia Falls, Montana, Anaconda Aluminum is upping its production from the present 87.5% capacity to 100% by summer. And up in British Columbia, Alcan is spending $1.6 million for furnaces and equipment to allow its big aluminum smelter to produce 36,000 tons of extrusion ingot. So what's all this talk about recession?

— The Editors

How Aluminum helps "Porky" flavor the ham you eat!

"Porky" supplies the meat . . . curing preserves it and provides the distinctive flavor you enjoy. Best curing results are attained when brine is pumped at constant uniform pressure. This assures an even distribution of flavor and color, and adds to the over-all excellence of the meat."

Brine pressure for this curing process is maintained via two aluminum impellers, coated with neoprene, that oscillate at 3500 strokes per minute to generate the necessary flow. Aluminum is a must – because of its light weight, strength and superior machinability. It bonds well with neoprene. *And*, it is *always quickly available* from Frasse.

Frasse stocks aluminum in practically every form . . . in a wide variety of grades and tempers – and size ranges are unusually complete. So, standardize on Frasse as your *single* source for aluminum – you'll find it a time and effort saving convenience.

Courtesy: Eco Engineering Co.

Call FRASSE 1st for ALUMINUM

Screw Machine Stock
Rounds • Squares • Hexagons
Rectangles • Angles
Channels • Sheets • Plates
Tubing • Pipe
Fittings • Extrusions
Tool and Jig Plate

Peter A. Frasse & Co., Inc.

NEW YORK 13, N. Y.
17 Grand St.
WAlker 5-2200

PHILADELPHIA 29, PA.
3911 Wissahickon Ave.
BAldwin 9-9900

BUFFALO 7, N. Y.
P. O. Box K, Sta. B
BEdford 4700

SYRACUSE 1, N. Y.
P. O. Box 1267
HOward 3-8655

HARTFORD 1, CONN.
P. O. Box 1949
JAckson 9-6861

LYNDHURST, N. J. • **ROCHESTER, N. Y.** • **BALTIMORE, MD.**

HARD COAT

The Longest Lasting Finish for Aluminum

American Anodizing — first with the hard coating process in Chicago — now offers the most complete hard coat facilities east of the Rockies. Tanks measure up to 20 ft. long, 7 ft. wide and 7 ft. deep.

The Alumilite and Martin hard coating processes (Duranodic Finish Architectural Application) extend the useful range of aluminum by producing a high abrasive and corrosion resistant surface. They also provide high dielectric strength for many electronic applications.

Typical uses are light duty gears, typewriter parts, textile machine parts, valves, servo body mechanisms, hydraulic cylinders, cams, guides and tracks, abrasion strips, impellers. A unique application is the salvage of parts machined undersize.

In addition to hard coating, "AA" has complete facilities for both **clear** and **color** anodizing. Processes also available for Iridite and Alodine.

Alumilite*

Martin

Hard Coat

*Licensed by Aluminum Company of America

HAymarket 1-3500

AMERICAN ANODIZING CO., INC.

1820 West Lake Street

CHICAGO 12, ILLINOIS

SPECIALISTS IN ALUMINUM FINISHING

FOR A BETTER JOB IN LESS TIME...

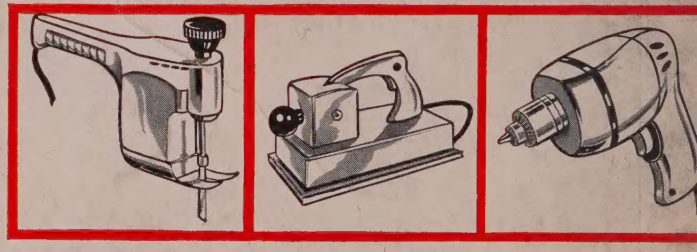
he's using power tools made with aluminum

Please Return to
Missile Systems Library
Raytheon Mfg. Co.

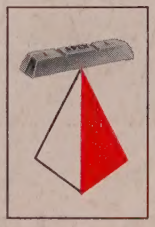
Today's homeowner is handier than ever and the professional works faster, delivers a better job—thanks to power tools and the versatility of aluminum. Whether you're sawing, sanding or drilling, these specialized tools provide the modern, easy way to finish the task.

Lightweight aluminum helps make power tools more portable, easier to handle. They give better service and last longer because aluminum is stronger. It's the one metal that resists rust, corrosion, pitting and chipping, always stays new looking. Too, manufacturers prefer aluminum because it can be formed in many ways, is easy to machine, and saves costly production steps.

Apex Smelting Company and its metallurgists work closely with the foundries and die casters who serve the power tool industry. Custom and standard aluminum alloys, scientifically produced by Apex to rigid specifications, are providing the performance and quality you want in these modern day work-savers.



Research leadership back of every ingot



APEX SMELTING COMPANY

Producers of ALUMINUM, MAGNESIUM AND ZINC ALLOYS

CHICAGO 12 CLEVELAND 5 LONG BEACH 10, CAL.
SPRINGFIELD, OREGON (National Metallurgical Corp.)

Warehouse distributor of ALCAN foundry alloy ingot

Your products may also be produced better and more efficiently with the help of aluminum castings. Apex Smelting and the companies it serves in the die casting and foundry industry stand ready to assist you and your engineers.

NOTICE

THIS VOLUME IS INCOMPLETE

THE FOLLOWING ISSUES ARE ON ORDER:
Vol.16 No.3 1960-61